

THE NATIONAL GEOGRAPHIC MAGAZINE

Vol. XII

APRIL, 1901

No. 4

CONTENTS

THE OLD YUMA TRAIL. BY W. J. MCGEE, VICE-PRESIDENT NATIONAL GEOGRAPHIC SOCIETY. ILLUSTRATED . . .	PAGE 137
★	
ADVANCES IN GEOGRAPHIC KNOWLEDGE DURING THE NINETEENTH CENTURY. BY GEN. A. W. GREELY, U. S. ARMY. ILLUSTRATED	143
★	
MEXICO OF TODAY. BY SENOR DR. DON JUAN N. NAVARRO, MEXICAN CONSUL-GENERAL IN NEW YORK CITY . . .	153
★	
GEOGRAPHIC NOTES	158
★	
GEOGRAPHIC LITERATURE	165
★	
PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY . . .	166

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*I have done the same
thing by clear implica-
tion.
I have made it equally
plain that I think
the negro is included
in the word "men" used
in the Declaration of In-
dependence.
I believe the declaration
that "all men are cre-
ated equal" is the
great fundamental
principle upon which*

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THE OLD YUMA TRAIL.

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THE distinctive part of the Old Yuma Trail lies between Sonora long $112^{\circ} 39'$ and Sierra Gila long $114^{\circ} 04'$, the south-westernmost range of Arizona. Between these points a nearly coincides with the international boundary.

If the old time Hualpa de Cori there are several to many trails. The ancient and modern pilgrimage paths lead westward from a habitation long $111^{\circ} 40'$ to a capricious watering place at the southern end of Santa Rosa Mountain long $113^{\circ} 30'$, and hence on to Sonora; the early Mexican route ran through Magdalena and Santa Ana, and thence through Apatzan, over the plains to the Santa Rosa water, the Mexican approach (afterward adopted by many American pioneers) can be traced through Honduras to the old mission of Tame and thence through Arvaca and Sasabe to a practically permanent water at the western end of Sierra Babagayari (Rosa Verde), and on over the plains may intersect at the boundary to Santa Rosa, at nothing was an alternative American

approach lies through the arroyo of Tucson and by Chivote spring to the northern end of Sierra Babagayari to the trail trail anywhere east of Santa Rosa, and the ice to Sonora. For this trail westward there is but a single way to Tame as Arvaca near the southern end of Sierra Gila, but there the tracks diverge, one distribution leading down the northeastern side of the range to Rio Gila and then through a long narrow pass and the ice directly northward to Yuma, with a third theoretically possible

side save by well equipped expeditions across the shifting sands stretching to Rio Colorado at the point touched by the Arizona Sonora boundary.

The Santa Domingos of today stands on the site of the wooden cross erected by the padres over two centuries ago; it is a feudal Mexican village in the type prevailing in the rest of the country, and governed with fidelity to the distant but beloved President on the much adored Carrterera wars to Mexico, what Victoria was to England by Don Cipriano Ortega, it could

with Santa Fe, and besides a quarter-horse of mine and grana, set out on the Old Yuma Trail, under an arrangement with a party to deliver water and feed.

This country of 10 miles west by the trail evened out at the entrance of the wagon and the four saddle pack animals of the expedition were on the trail before long. Crossing a sandwash of 100 yards to a small broad canon of the Chino, we entered for the first time the desert by foot only but not the way men traveled over a well-sorted plain some 1000 feet above the level of the sea, revealing as it did the sheeted and curving in occasional projecting bosses of granite passing horizontally as it swung a few yards north of the boundary to leave at Guadalupe to the Papago village with the contrasts between the sand and the narrow brush and a dead clover native but new there. Here the entire winter population of Mt. M. G. Levy met and in the owner's justice of the peace and deputy sheriff was readily brought to the native residents attentive as before the times was on the erect and the side barriers and the lower carterens of the outfit were soon filled with the slight alkaline water and a horseman water from the spring. Quintero was named the northernmost of the hills of a series leading the trade of spring and village to the sea, away the range divides a sort of ridge off southward to form Cerro de la Cruz and Sierra de la Cruz, and the two rivers partly to give it as sparsely, partly to reach the "last water" trail itself.

Beyond Guadalupe to the north, the ground is impressive. True, the narrow stock path followed by the wagon is in large part new, but, as well seen from the crest of Cerro de la Cruz, the new track diverges from the old only because the old was so deep that it has become a short-cut across a valley of the old and new, and the new is a sandwash during its brief sports of activity to correct the wheel worn way into a broad channel. Previous to the and ruins of the early stone age are sparsely scattered over the plain. The ruins of a Mexican ranch, with well and corral and pyramids, lie later in the west of Guadalupe and a few miles from the sea, and a few miles from the "last water" five miles beyond, known commonly as "Agua Dulce" from the



A canon in the desert, revealing as it did the sheeted and curving in occasional projecting bosses of granite.

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and the sweetness of the water proper to an "Agua Salada" from its salinity. The "agrio" is merely the small residuum of underflow and basin seepage brought to the surface of the Sonoyta sandwash.

A dipper on the ledges of Cerro Salado in the southwestern extension across the valley, and the banks and bottom are excavated with frost-like efflorescences of mineral salts. The water is fair for stock, just so for men. It is a resort for wild cattle and horses and for dogs ranging the sierras and valleys for twenty miles beyond, but the latest sign is that of Don Bartolo's outfit, whose casks and kegs were lined two or three hours earlier. Here we pitch a tentless camp, with the first graves of the Old Yuma Trail on a low spur hard by; the sky is clear, though the air is heavy and warm, and Coyote the Wise One

Capango and I creep near to sing his song—a sleep-breaking wail well understood of the vaqueros.

THE START OF THE SONOYTA

The first faint dawn of the 17th is ushered by a slow sprinkle from low clouds, forming a fog-bank half way up the Cerro, but so high overhead that the big water starts glimmer, brouha, and clarkets are anxiously rolled and loaded.

Breakfast is eaten and the outfit starts for way in the gray twilight. At its sunrise the floating fogs fade, revealing the entire saltpan in which Rio Sonoyta comes to an end—a basin of a score square miles, bounded on the north by Cerro Salado and its foot slopes, on the west by another range running down from Sierra Chusquea, and on the south-east by a sheer foot slope sandbed with volcanic batters and mesas, while the old lava crevices subside toward the thin slope of a hill of unmined foot cones marking the margin of the Red Desert—a sea of sand some six miles long, the jaws of Sonora from Kino's horn to La Pos Point. This is the "sack

of the Sonoyta" in the pioneers' terminology, its evaporating vat in physical fact—after freshets it is lake or more, according to the volume of the flood, and then bottomless mire for weeks; now it is a Tann patterned carpet of red, white, yellow, and black efflorescences, relieved by the greens of salt-crystallizing shrubbery on higher spots. On the hard baked surface crust the acids drum and the wheels rumble with a hollow reverberant or more startling to animals than to men—a gut reminder of the use of trigones gauge in the track-crane sump. A herd of wild horses see or scent the lead up to resumption from atop and after deer-like stumps and sports or other signals gather in a bunch with dams and foals to the lead and moan in the rear, to skid with amazing swiftness—even to the wind-axes of Arima—down the rocky slopes and over the remaining plain obliquely across the trail toward the impassable sand dunes; while an occasional mob of wild wild horses may be glimpsed harking behind mesquite clumps or scurrying for more distant shelter.

The trail leaves the about latitude 33° 10', and then angles south on the top of the Cerro, thence it descends north-westward over rocky foot slopes, bending slightly to avoid isolated outcrops and cutting gaps between arroyos, for a dozen miles—then it appears, like a wide and the inviolable frontier, where the mesa topped valley-pool of Sonora western Arizona. Just as we take horse we overtake the sun, the outfit would still have been there in daylight, and each of the broken gorges and the long night time by the Mexican to replace it, where the human staff by the stock, and we foreman to replace the place, a growing apprehension as a cold hole as the rate of miles of Capangueo gather to break in stormy showers and a spectral darkest danger of the arroyo. After arriving a tremendous where guinea grass may be

and for all stock trails are now lost beyond, the high drift pushes on to outspans a vast of moment 1781—long and 113' 20'—the first "cave" camp on the old trail. Here signs of antelope and deer are seen, and the galleta is recovering slowly from the overpasturage of the mid-century. Mr. Will fin is a common aboriginal cache in a cavity of the cave—the one which the hunter and star is—and his were come and go throughout the night.

ACROSS PLAYAS AND MOUNTAINS

The second morning from Santa Dominga is cool and cloudy. Blankets and saddle are still with the wet, the animals frugal, but three miles of snow is going and a rising sun brings comfort with the passage through a ring of granite peaks rising abruptly from the level plain, and the pass is a gateway into Tule Desert. The first quarter of this expanse alternates between bare playa and a lax thicket of *creosote* (*Larrea*) growing in exuberant luxuriance. Stumps twelve feet high and branches fifteen feet long are common, while the main floor is floor everywhere by great shrinkage-cracks, often a foot or more wide and a yard or two deep. Fortunately the showers have been light, yet the wind is so tiresome and, for so deep, for so miles and twice so tedious for the wagons. The next fraction of the valley is a tongue of the Red Desert reaching into the western end of Sierra Huacate and stretching a dozen miles northward to lap the base of pink-colored Sierra Pinta for five miles. The old trail, which was lost in the playas, reappears here and there as a deep worn way, partly filled and often obliterated by drifting sands, and the dead drag is the more inspiring for our steady upgrade toward the mountains belt crating Tule Valley.

This unipitous—theme of many a trav-

eler's tale—forms a most feature of the old route. It is a vast sheet of black lava stretched up toward Sierra Huacate, over a group of craters, and prominently marked as well, a few furlongs or miles south of the road, by two so worthless, in general, as some, of the principal lines and lozes of a country as the rugged scarps of the margins remain. But with the surface is weathered into a pavement of pebbles and led below a tight yellow sand, but is used a cover by a "desert varnish" of remarkable brilliancy, and the pebbles are set so close that the varnished surfaces form a nearly colorless mirror miles in extent, reflecting light and heat with a brilliancy.

The mountains beneath is a low mesa on which grows a small scrubby mesquite or saguaro (*Cereus giganteus* or *pitahaya*, *Cereus cholla*), has found lodgment. It offers fine views of the Painted Range to the north of the desert crests and pointed peaks brought out by the alternation in Tule Mountains, and especially of Sierra Huacate, now falling into the rear on the left, and the last view serves to recall the reports of the pioneers by showing that Huacate is not a crater but a range, that the trail passes miles short of its nearer base and that it rises from the Red Desert quite like other ranges of western Sonora, though to a better height than any neighbor. Through the polished pavement of black volcanic lava, the larger pebbles and boulders have been taken out of the way of wheels by generations of travelers, while the smaller are ground into the ashen sand, and at intervals are excreted a few bit-sized traces. The bordering pavement is broken by cross-shape pebble poles marking the routes, and now or a corner again of mortar and chills, elsewhere of two or three and its companions, but more common of the single traveler as told vaguely by the size and form of the heath—

the subject was a
dying

RESULTS

The rocks are breached on the northeast side of the volcano, on a passing shoreward, then pushed on the higher peaks forming rapid descents. The lower mountain the clouds show the weathered substance of Sierra Leone dense with those in neighboring are higher than the cloud mass, and at a distance to be seen in the most direct view.

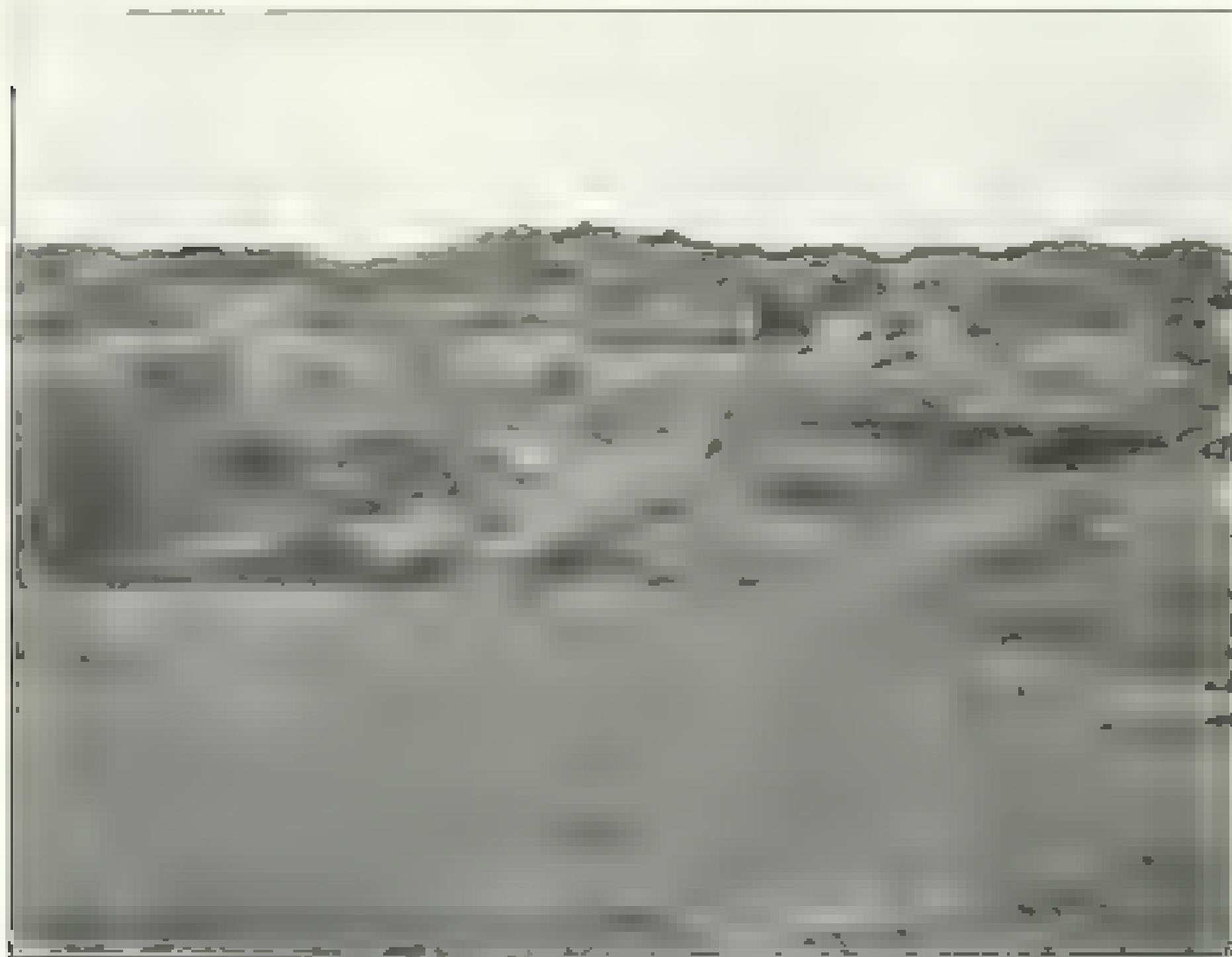
The V₂ evolution,

and both coasts of the Gulf of Mexico, and in the western part of the United States, where the highest strike is in the Gulf of Mexico, and the highest of ex-

structure in every aspect of the design. The peaks the club bank was a

3000 feet high on the west
 slope above, but the rocks in the
 east on the slopes of the mountain
 three miles across the lake
 , the water is the over-
 land covering from the sides of
 these mountains seemed to be run
 toward, save for a good flattening out
 mass drifted into the valley and grew
 in size. It was most curious to be
 able to see into the mountain and out
 during night of the starry sky—was

For ten miles or more and a
few miles and would not be
scattered measures with the
on our, we were for half as long
the storm was nearly a
mean we turned and back passed
forward passed overhead, and
the air blew across the boat
ing in, and we were for
the sea still not
whether as they came



4. The \mathbb{Z}_2 -action on \mathbb{R}^n is given by

re for a sudden storm, and that a sudden change of direction and prompt action was required to protect the wagon as the work turned tail. The wind shifted without changing direction, while the shower became a torrent, and ten minutes later it was in the gale was driving the drops in a nearly horizontal sheet across the dome tops, while the temperature had fallen from 70° to about 55° , and small bushes now formed apparently within a dozen feet of the ground. Ten minutes more and the gale was down to a lull again, the torrent to a sprinkle, then the rearward half of the camp broke drifted down before the wind.

At the low swinging sand dunes the chosen pass presented its way toward Sierra Plata evidently meeting a new escape already being closed its southern side. At the conjunction there was much light fog and some parallel timber for a few minutes, but the vapor bank spread along the range, and either melted away or drifted out northeastward. During the twenty minutes of continuous pour the ground was a white or a yellow, estimated from each moment to water pools etc., yet over the waste of drifted sand not a tree was burned, not a prairie was protected, and even a water surface was seen save in the few "shag spots" (i. e., oaks and willow patches) of the lower side. The sand simply was covered the flood like a sponge, and was very moist only to depths of 3 to 4½ inches.

The storm over the cattle heads again toward the distant pass, though Molyer's voice later (or twice over, in typical cowboy emphasis) a "bet that when there's a fever for the break the tongue will be the stone to break upon it." And a half hour later the Mexicans took up, and a foreboding murmur was taken, beside the forelegs, to verify the inference. No camp is made in a windless spot (save for scattered creosote bushes), while "the gringos" turn back to make repairs and bring up

the supply within a point about 100 feet from the 3-33 twenty miles short of that specified in the contract with the bar to it. It is the third night's stop, and the second "dry" camp on the trail—though denuded. The camp is a very old one, the site is a very old one, and the site is a very old one.

THE WAY FROM THE PASS

By daylight on the 10th the wind shifted from southwest to north-east and grew ch. The great clouds drove toward the low and spread before the rising sun in a fashion more typical of deserts than of sage-brush lands. The wind and water are transferred to the lighter mist while the supply team is turned back toward Santa Theresa. With a dance to dinner and no, the camp they did no worse. The ancient trail forward is a deep furrow in the soil, and as these grade into the side of the valley margin toward the Pass the furrow becomes a series of sections of arroyos, normally settling on a plain across the trail but oriented for holes or ridges where deeper cut of the wagon way, and with a five in foot the arroyos

it is a series of facing run brim in, for minutes. The trail with the overland from the south on the south. Gradually the way rises through sheetflood carved foothills, and then winds a long buttes and granite walls toward an old ranch. The trail is a series of ridges and valleys, with the abundance of rocks to mark them, the ventral trail of an American on a good horse or a Mexican on a shaggy beast forms a clear path. The trail is a series of ridges and valleys, with the abundance of rocks to mark them, the ventral trail of an American on a good horse or a Mexican on a shaggy beast forms a clear path. The trail is a series of ridges and valleys, with the abundance of rocks to mark them, the ventral trail of an American on a good horse or a Mexican on a shaggy beast forms a clear path.

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very and Lechuguilla, to almost obscure more of a territorial line by the post-superior of Yuma County—and incidentally to indicate "Tule Well" and advertise the name and wisdom of the last passenger, the American horseman, in the leading inscription "Agua Salada 75 miles—go back and fill your canteens" (J. Q. Taylor). Thenceforward the way is freshened, and the miles heartened by the year-old tread of the conscientious supervisor.

The well, long since 113° 45° is a mile or two from the plain trail, is now a name on trap and tongue, and a caving pot in rocky clumps with a barrel of liquid at the bottom—liquid even more saline than that of the Gila, but more potent in its overpowering flavor of copper salts and strong fractures of scale insects and drowned mice is from which even the thirstiest horses turn in wary aversion. In the palmy days of the old Yuma Trail it was a way station, a place to refill provisions before the range was repurposed; there was a cluster flora which helped to bear moisture, and the water was made to last by constant droppings and renewals; now it is but an echo and a delusion, if not a poison brew for the chance traveler. A league west of the old well and a mile from the main trail there is a high hill—a water pocket in the granite range reaching now from Blackhead Mts. to the Colorado-Cañon Picta, a wind-water may be found by a brief climb or a trail of spring or other local storms. The lack of water is a desperate one during most of the year.

Beyond the main trail indicated of Tule Pass the trail with many granite cobbles, smooth peaks, low ridge crests in the evening.

The soil, gray and cream, pink and rose with a wash of sand, is a rose of red from the valley floors of eroded granite, the

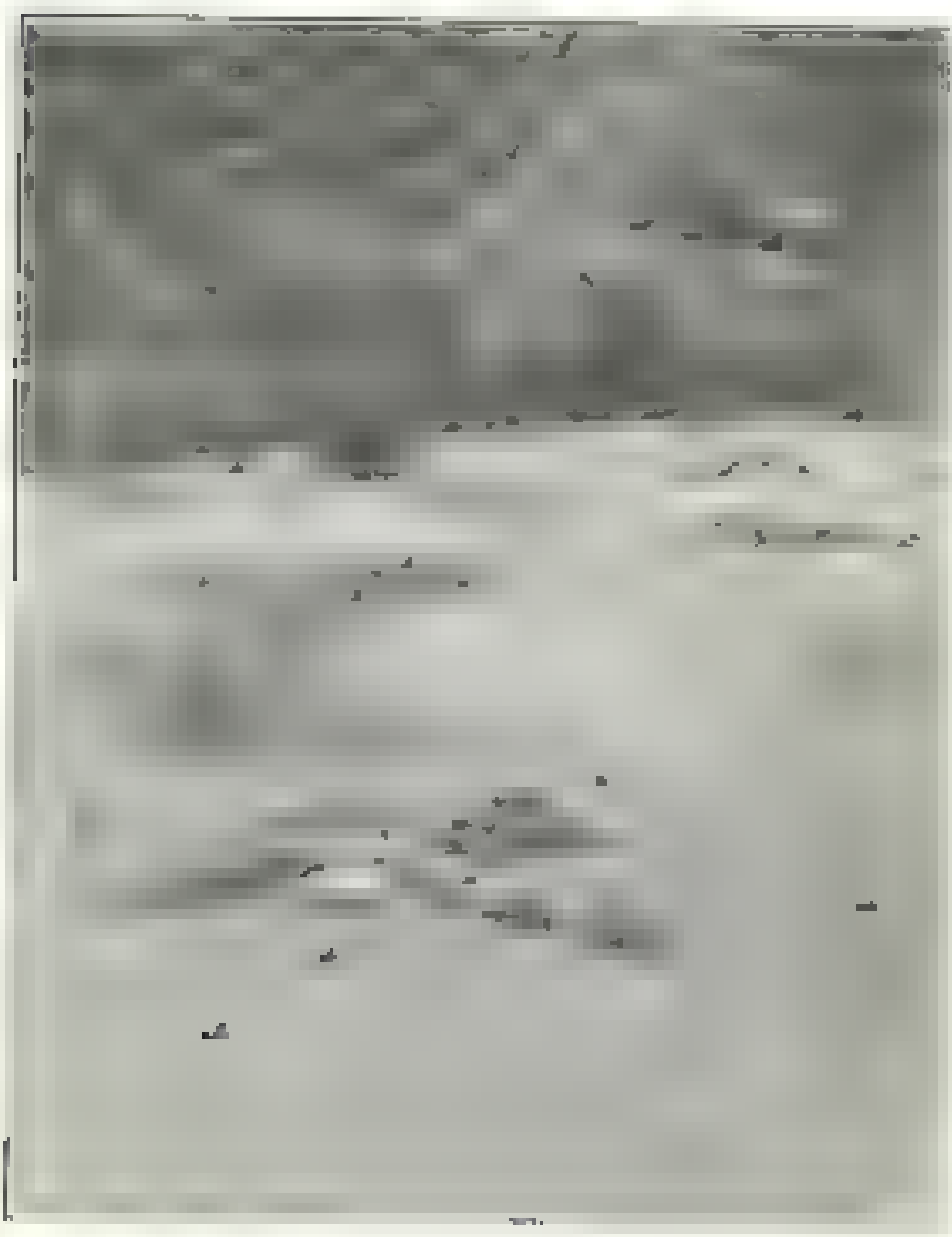
valley waters through a two-mile run—a great natural course—of granite wash, a whole day's night be hauled

against cyclonic or armed invasion, while the miles of granite are constantly in sight—yet all this granite is but as a hard specimen of the western Sonora and adjacent Arizona.

THE VALLEY OF THE LITTLE LITTLE

Fifty miles west of Tule Pass the rugged mass of Tule Mountains falls away, first on the left and then on the right, giving place to zones of malpais with a slope down to Lechuguilla Valley, and here again the present trail is a direct of yellow and black. Here, too, the narrow cemetery of the Old Yuma Trail grows in the pebbles, for here the desert is most dead and water most distant, the grave-marks are too many to note—save the 30-foot circle of pebbles with a great pebble cross, the center recording the threshold of a family of seven who staked life on a demon of water which was not their any broken. Captain Gifford pictures this "cemetery" and adds: "The wagon tracks made when the poor Mexican drove his exhausted team to one side of the road were plainly visible thirty years after, and at the very spot still remain pieces of glass and wicker work from the broken chairs, and the skulls of the two horses." The sun swings low as we pass this pathetic memorial and others in the desert malpais, and as it sets behind the Sierra Gila we push for a mile or two on the silty plain to the "dry" camp, where the team-waters drink the last of the water, where all is dead and where the silence is one of loss and grain comes to an end—but the blankets are still laid up at the high school of which there are worse things in desert life.

Lechuguilla Valley is named from an incensewood as agave like plant of three or four slender staggering stems a few feet high—it affects chiefly the rocky way and arrows, leaving the granite



* Looking down on numerous cross-marked graves.

sides to wide scattered fields of cressets and rare specimens, and on this waste water a speck of shore-growing willow trees, the sign of the Fifth and from which, about one-fourth from the "last water." The town range and hills are another growth of grasses, but it is not until high noon that we draw up the sheet flannel, and see what which may be of our characters like those of the cressets, and pick up the shot arrows to the classic sign of the old trail—has no less as Atlas. The high tanks, long—about 14² 5. Here, thirty miles from the nearest mission and looking down on numerous cross-marked graves—many now cross-marked to mark can tell, we find the midst of a burning party—now absent on the

after drinking deeply at the lowest basin face suspiciously on their spurs.

TANKS

There are a series of tanks, partly pools, partly cataract pools, within the high basins, flowing the streams of the region. One of the largest is called partly by great boulders and granite debris and is reached by a steep 100 feet of flint, and the climbing over several rock leads to two others, and a 50 feet more there is a third, higher, and one of the party found a fourth, and there came to our tenth stopping at a summit slope apparently leading to the seventh basin. Looking down the average level of the tanks, the Tama, in the quantity of the Yuma supervisor on a guide-basis, seven miles away. The tank was made partly to examine the Indian mortars ground in

the ledges and great outcrops about every pool. Mortars numbering 100 are found, and it is said by some of the few needles old but most so ancient that he pointed out how a tree high above the copper-red rocks around about in

according the visits of numerous generations of natives, to whom each locality was what has been at once symbol of and invocation for precious food and life-giving water. One mortar bore 40 pits on its upper face, at other 24, and up to one highest there a real bird was found in corresponding position. Most of them must have been made by Padre Kino, who passed this way

at two centuries ago and mapped the route and "Tama" in 1702, and most of the others must have witnessed the long

proposed to be prepared
what is of the City of
Tulsa to make a
new map. Then we have
the gradual settling of
people's minds on it.

as the law's customers interest the light to the gas present problems in the legal and in the economic, but it may be not all there yet, it may be on the low side of a rigged range, too. I'm looking for the law's attitude from the end of the

...and that with each new job, a series of exceptional long spots of the two

Six weeks prior to the attack, Altair's bid for the contract was rejected. The ten-week contract was estimated to cost the state and its experienced employees approximately \$100,000, and other money for the free labor of the supply plant cost \$100,000. The tender was rejected as well as the

The next-and last-day is a hard one.

Lower slopes of a plain alluvium, in the
" " " "
now covered over which the waters from a
local storm in the mountains flowed
yesterday as it flowed not in collecting

It is not up at later times of the season.



The lowest α is reported in our data to have been 0.0001, given the definition.

the human ear, not in the ear itself is
of the correctness of the concept that
in a process of interlocking sentences, un-
derstanding and dividing every few words or
phrases, and digging side branches across
the trail to the average number of a
hundred per mile. In to these he wagon
loads and out of them it is pulled as
the lugged miles hour after hour, until

The northern horizon 17 miles away, and peaks with passing clouds have one by one in swift succession but the tarred volcanic mass that he could not quite comprehend. "Kibiki's Temple," by Mr. Gill² is more accurately sketched as a lattice work of growing pyramids. Ever before in day and night trade the first seeds are leaving the Sonoran range begin to appear. In the distance on a sunny country is spoken by Carroll; but it is long after nightfall of the sixth day from Santa Sonango before the animals are comforted with hay and barley from the single store in Chihuahua.

² See the account of the expedition to the Colorado River in the National Geographic Magazine, Vol. 1, p. 100.

A HISTORY OF THE TRAIL

No traveler over the Old Yuma Trail can fail to feel the magnitude of its present condition with its past history. It is the way of the western world to grow in population and wealth, to increase in industrial and intellectual development; yet this old way is perpetuated only by graves, enriched with its memories, nearly as lost to history and not as great as the same to the eyes of Arizona and farther westward. The routes of Cabera de Yuma and de Sonora and Colorado are gone save to the long line of the trans-Arizona roads of our own generation are large and forgotten, many of the trails of the argonauts are effaced even to the memory, but America probably presents no other house



from people is not a total or least so complete as that of the zone troubled by plague, famine and five generations of holocausts—and the lapse seems the greater because so characteristic of our own progress.

There was reason enough for the abandonment of the route as a line of travel and trade, the increasing safety of supplying first graded its claims, the vision of Mexican next extinction, its questions, and the railway's spreading. The continent finally tapped its reservoirs at that terrain, yet the factors entering in the abandonment of the route only partially explain the desertion of its pursuits and serve rather to fix attention on the fact that the entire route traversed by the trail was gradually impoverished by the long-continued and short-sighted overtaxing of its meager resources. When the earliest Caucasian pioneers came, they found the province peopled sparsely with semi-nomadic Papago Indians, who wandered off in search of water, located settlements even by the temporary wettings of chance storms, and created shanties about the more permanent springs and meadows. Thus at Alamo among others. They also found a fauna of deer and antelope and bighorn with their carnivorous consumers, as well as birds, rodents, reptiles, and insects in wide variety and moderate abundance, and as the basis of the nomadic life they found a varied flora tolerably balanced between hard habitat and dependent fauna through environmental adjustment. True, the aggregate vitality was but a fraction of that characteristic of humid lands; yet the deficiency was partly made up by a longer and vital life and a closer vital economy growing out of the exceptionally perfect solidarity characteristic of the living things of arid regions so that the sum of living resources was still great for reasonable demands. Two or three generations of Caucasians drew on these resources in the easy way of rest-

ful latitudes without serious detriment, the Indian armies and caravans followed tribesmen's trails to tribal domains, and sought water and food with or without mutual exchange; their animals found forage in grasses and shrubby species, while they were able to dig game or gather certain fruits, and so on with the effort, and so long as they were few, the vital nature even as the throughness of earth-making was little disturbed. With the third or fourth generation and the gradually increasing

sources began to suffer, the forage grew scarce, the wantonly hunted and with few from the nearer ranges, the big game became wary and betook to other ranges; with the decimation of plants and the tramping of stock the soil grew less retentive of the secret moisture, a rate probably higher than that flowing deforestation of humid lands, so that the meager ground water disappeared, the smaller springs went dry, and the climate became a trifle hotter rather than the base of the old one, and with each degree of vital degradation the Papago Indians withdrew a remainder of vitality, or else degenerated into a partial dependence on the whites and wastage of the wastes. Still the natural balance was not utterly destroyed until the Anglo-Saxon came with that reserve energy which he is at no other place braver to delay. He deepened old wells and dug new to reach the last drops of dwindling ground water; he not only drove herds to devastate the encumbered domain along the way, but attacked the adjacent ranges with cattle and sheep to supply the needs of multiplying troops, and he stopped only at the fortunate conjunction of railway making a more numerous race with no other occupation of the grasses and other forage plants along the old route, and the consequent extraction of the useful fauna and destruction of the minor wastes.

The American desert stands apart from

were also a reflection of it to send a waste
bins have been brought into barrier
area and they turned up a wash into

of spring water ways. Increase in
 vegetation and lake waters and quar-
 ters have been so much as to work for a
 check on the streets and houses. In-
 creased public houses for excessive per-
 sonal games. It is a way of adjust-
 ment of American society. New en-
 strated acts and have destructive. Yet no
 new ones are more extensive destruction
 than those between the projects from
 1911 to 1914 and the early 1910s.
 at the vital substances of and regis-
 tered of all the examples of destructive
 and not between projects and precedents
 some are more impressive than now
 so clearly attested. The Old World
 from

Cambridge, are dark lines of the past, to carry a lighter complement. Science—and American progress is but science practically applied—advances through experience, its best success and failure no success could be more instructive than the failure attested by the moon.

[illegible]

So the wisdom, if not the imperative necessity, of advertising means to conduct the same reevaluation of good and bad as the falling leaves of the Good and Bad Tree.

ADVANCES IN GEOGRAPHIC KNOWLEDGE
DURING THE NINETEENTH CENTURY

BY BRIG.-GEN. A. W. GREENY, CHIEF SIGNAL OFFICER,
U. S. ARMY

In these days geographical exploration means not merely the topographical distribution of mountain or river or lake or plain, but also the determination in a cursory manner at least, of existent vegetation and animal life, of climatic conditions, and especially of the ecology of inhabited areas.

* Revised as requested by the editor of the *Journal of the American Medical Association*.

In forecasting the evolution of any aspect of the twentieth century one soundest base must be the advances of the nineteenth century along these lines of research. Judged by this standard, the present century will perfect the aspirations of the explorer of the last century—make known the entire surface of the earth. Few appreciate the enormous advances in geographic knowledge and

ing the last one hundred years which may be summed up in the general statement that fully 60 per cent of the world's land area was unexplored in 1800, while scarcely 10 per cent now remains unknown.

At the commencement of the last century the four greatest geographical problems were the Northeast Passage, the Northwest Passage, the sources of the Nile, and the North Polar quest, the last only remains.

THE ARCTIC PROBLEMS SOLVED

The Northwest Passage first was led to secrets by the energetic explorers of this age. The result being attained by a series of voyages almost entirely under Danish auspices that are unsurpassed in former duration and heroism. Attempts for a Northwest Passage, interrupted by the death of the great navigator James Cook who lost his life therein, were renewed owing to the success of William Scoresby, Jr., in exploring East Greenland, 1817-'22. Prosecuted both by land and sea, material advances came through Parry, Ross, and Franklin, 1819-'35, while the voyages of Adolphus Wilhelm, Melville, McKim, McClure, Rae, and others in search of Franklin, 1845-'59, completely solved the mystery.

Parry, in three notable voyages explored the greater part of the northern waterways north of America and was first in Hall's Bay to Bering Strait passing north of the magnetic pole. John Ross explored the Felix Boothia Peninsula, the north point of the continent of America, while his lieutenant and nephew, James C. Ross, located the north magnetic pole at Cape Auckland, 70 degrees 5 minutes north, 96 degrees 31 minutes west. The northern coasts of America were outlined by the intrepid journeys of Franklin, Beechey, Denham, and Simpson, 1812-'46, from King William Land west to Point Barrow.

Other notable advances have been made in Arctic America by Ingfield, Kane, Hall, Nares, and Greely in Greenland Land and Northwest Greenland, by Argyuski, Gensecke, Gade, Hedin, Steele, and other Danes in Western Greenland; by Serresoy, Linné, Knudsen, Nordenskiöld, Gade, Carlén, Rydén, and Peary on the east coast, while Nansen and Peary have explored the north ice, the latter to the extreme southeastern point of the new map of the north of Greenland discovered by Greely in 1883.

Peary, in his last expedition, has discovered the north of Greenland's square by Greely in 1883.

ADVANCES TOWARD THE NORTH POLE

Spitzbergen has been fully explored by Gairdner, Nordenskiöld, Terrell, Leigh Smith, and Conways. Weyprecht and Fayer discovered Franz Josef Land, whose limits have been extended and defined by Leigh Smith, Jackson, Nansen, and Welmann. De Long discovered Bering Strait to the New Siberian Islands, and Nansen's extraordinary continuation of De Long's expedition of Spitzbergen has most materially advanced our knowledge of the Siberian and Polar Seas.

Advances toward the North Pole have been made through the exertions of Scoresby, 81 degrees 30 minutes north; Parry, 82 degrees 45 minutes north; Nares, 83 degrees 30 minutes north; Cressy, 83 degrees 24 minutes north, the most northerly land as yet; Nansen, 86 degrees 14 minutes north, and Arctowski, 86 degrees 33 minutes north, with geographical miles on the Pole.

As to the Northeast Passage, Nordenskiöld, having failed in both its scientific value and practicality, selected Peary as his navigator. Sent from Tromsø in 1878, they passed Kara Sea successfully and readily rounded the north cape of Asia. Beaten by ice and obliged to winter with a crew of 12 on the Bering Strait. Nordenskiöld com-

pleted the circumnavigation of Asia in 1893.

Within the Antarctic circle, to the south of Patagonia, Palmer, Beaugrenier, Brane, Larsen, and Gerlache discovered Palmer Land and adjacent islands. To the south of New Zealand Henry M. and Blunell, and James C. Ross added to his arctic laurels by discovering uncharted Victoria Land with its flaming volcanoes, and by reaching the southern magnetic pole. South of Kerguelen is the Emperor Land of Beaugrenier while southeast of Tasmania an archipelago of new-discovered islands named by Wilkes and D'Urville marks the northern limit of uncharted Antarctica.

EXPLORATION OF AUSTRALIA

The greatest southern continent, Australia, has a European population exceeding five millions; but in 1800 its two thousand settlers could not even name a country with a recognized name. As New Holland it appeared on the best maps, a featureless central area with its outlined coast largely conjectured. Surveys of the coast, begun by Bass and Flinders, were finished by King (1822); Wickham and Stokes (1847-'48). Inland, Hagen solved the hydrographic problem of the Murray watershed, having traced the southern coast along the Great Australian Bight. The

Macell and Stuart, while Grey and Gregory explored in the northwest and Leichhardt and Kennedy in the northeast. The most fruitful journey was that of Stuart, 1854-'58, from the isolated southern coast to the extreme north which opened a fertile, well watered district to colonization. The western desert has been explored here and there by Forrest, Warburton, and Giles, the last having twice traversed the great Sahara east and west.

New Zealand first came to our knowledge by missionary reports (1642)

and later by commercial extension and gold hunting. New Guinea has been explored in the last half century by Speke, Bates, Forbes, Von Seibitz, etc.

SOUTH AMERICA

Of the Americas the largest known almost explored. South America, however, was fortunate in the beginning of the century, 1799-1804, with such a voyageur as Humboldt and Bonpland who traversed Venezuela, determined the remarkable hurricane of the Orinoco, visited Magdalena, Quito, and the volcanoes. This journey was not only locally important, but it gave an extraordinary impulse to the comprehensive study of the earth. Von Eschwege, Von Wieg, Saint Hilaire, Spix, and Martins explored the interior of Brazil from the Amazon Basin, D'Orbigny and Castelnau devoted themselves to the geography of the central regions between the Rio de la Plata and the Amazon. Darwin, Wilkes, and Goss explored the coast lines of the continent. Wallace and Huxley did wonderful scientific work in the Amazon Basin, followed by Agassiz and a host of other explorers.

Stannett has mapped the Amazon-Chiriqui Parus.

In the Guianas Schomburgk's researches are the most valuable. In late years the most important explorations are doubtless those of the French international polar expedition at Cape Horn under Martial.

CATINAKERS IN NORTH AMERICA

If the continents of the other has so benefited by the explorations of last century as North America. To the genius of La, and energy of Humboldt was early (1804) due to modern geographical knowledge of Spanish America which was

materially increased by the explorations of Pike from St. Louis to Chihuahua and the Kansas, Arkansas, and the Rio Grande.

Kearney and Ziegler in the first half and Daly, Kennen, and Allen in the last half, of the century have outlined the general features of Alaska. In the Sitka, Kamike, Tanana, Nome, and Koyukuk regions the gold hunters have explored thoroughly. In Canada the early discoveries of Franklin, Richardson, Rae, and Back have been supplemented by Pettot in the Mackenzie Basin, Dawson and Ogilvie in the Yukon watershed, Bell and Tyrrell north of Hudson Bay, Jones in Hall's Land, and Low in Labrador.

As regards the United States, the country west of the Mississippi was almost entirely unknown in 1800. The early trans-Mississippi explorations form one phase of the history of the United States Army. The most fruitful in results of such journeys is that of Lewis and Clarke, 1804-06. They ascended the Missouri from mouth to source, crossed the continent and divide, traced thence the Snake and Columbia to the ocean, and returned over the Yellowstone. For the first time the United States was crossed from the Atlantic to the Pacific. The demonstration of the practicality of overland travel was an essential factor in the occupancy of Oregon, which gave the first foothold for the Americans on the Pacific Coast.

3. ASIA—THE GREAT WEST

Pike explored the valleys of the upper Mississippi, Arkansas, and Rio Grande, crossed part of Chihuahua and Texas, then unknown countries. Bodenev, 1832-'36, explored the valleys of the Platte, Green, and Yellowstone, and pioneer of the Oregon trail twice crossed to the Columbia, passing west via the Snake River, the Grand Kanble, and Blue Mountains. He also made known

the great basins of Salt Lake and Humboldt River and the pass across the Nevada to the Sacramento. Bodenev the first correctly charted the hydrography of the trans-rocky Mountain region, and elucidated the Rio Grande, ventura and other mythical streams. Fremont's journeys were important in initiating an extensive series of scientific explorations. Kearney surveyed the boundaries of Texas and Louisiana, crossed the country between the Arkansas and Canadian and Emory from Leavenworth to San Diego via the Arkansas, Del Norte, and Colorado.

Among the many expeditions may be mentioned that of Simpson to the Navajo country, Stansbury to Salt Lake, and greaves to the Zuni and Colorado rivers, and Mullen from Wupa Wada to Fort Benton. Important surveys are those on the Pacific Railway route by McClellan, Whipple, Parke, Williamson, and Daly, the Mexican boundary by Emory, the northwestern boundary, 1854-'61, and in later years those of King, Hayden, Powell, and Wheeler, which have elucidated most of the geographical problems in the United States.

RIVERS IN ASIA—GENERAL

In the geographical as in the political evolution of Asia the potent forces have been Great Britain and Russia, so that Northern and Southern Asia have been almost separate fields of enterprise for the dominant nations, with Central Asia as debatable ground for rivalry by both nations. In Northern Asia explorations in the early century were confined largely to the local extensions of knowledge, except additions to the New Siberian Islands by Semakof, Sirovinskof, 1804-'11, and Sumokof, 1804-'11, the Bering Ocean by Wrangel and Arzon, 1820-'23, and in Nova Zembla by Lutke, 1821-'24, Pachtas, 1822-'23, and Peron, Zeydler,

The formation of the Imperial Russian Geographical Society in 1845 gave impetus and direction to Asiatic discoveries, increased knowledge of the Russian Empire being the aim. From 1844 to 1857 Hoffman, Aksakov, and others

explored the Amur, Lena, and Saghalien, the Caucasian and Aral-Caspian regions were explored to the south-west, while to the east many expeditions entered Turkestan, Munghania, Khorezsm and Mongolia.

Between 1871 and 1883 Central Asia, Mongolia, and Western China were explored, largely through Przvalsky, and international polar routes were established on the Lena and in Nova Zembla. Severnoff and Prschenko explored Turkestan minutely, the deserts of north-western Siberia and Lake Balka were examined and a sea route opened from Tobolsk by way of the Kara Sea to St. Petersburg.

TIHET IS A MYSTERY

During the last fifteen years attention has been paid to Caucasian, Turkestan, the Amur, and Black Sea regions. In these years perhaps the most interesting explorations are those of Hedin who crossed the desert of moving sand dunes between the Yarkand and Khotan Rivers, outlined the northern rim of the great Tibetan plateau, and examined Lou Nor Basin.

Explorations in Northern Asia originated in the desire to extend inland the sphere of British influence. Political considerations speedily entered into the problem, and these barriers proved more difficult to surmount than physical ob-

stacles, and in 1891 passing across the ranges into Afghanistan and Tibet, the explorer necessarily encountered difficulties

in the wars of conquest and occupation.

Manning succeeded in entering Tibet in 1881, but was soon expelled. No

entrance was so rigidly enforced that the British surveys had recourse to secret native agents, and most of the early advances were made through secret journeys of pundits, among whom Chandra Sen stands foremost. As time went on it has been learned by missionary labors, especially in Tibet, through Huc and Desgodins, the latter also contributing much to a knowledge of Indo-China. In recent years both countries have been

explored by Sven Hedin, Gutzwiller, Dwyer, Hearn of Orleans, and others, especially the pundit Nani Singh, under our patronage that leave much to be

Japan has opened her unknown empire

to Japanese travelers to make its geography known, yet the geological researches of Naumann should be noted.

MAP OF AFRICA PUBLISHED

The extent to which exploration changed the map of Africa during the nineteenth century is known only to professional geographers. It is true that in 1830 the entire coast of Africa was known with some definiteness through the exertions of Portuguese navigators in previous centuries. Yet apart from the value of the Nile geographic knowledge of the interior was confined to a scant hundred miles seaward from the Mediterranean and northward from the Cape of Good Hope and to the estuaries of the Zambesi, Kongo, and Niger.

Geographic knowledge stopped almost within sight of the sea or the Lower Nile. Scarcely fifty years since there appeared, from 3 degrees north to 10 degrees north, on the best maps of Africa, the legend "Kang Range mountains supposed to extend across

the continent." Today it is known that this central area forms part of the great Congo Basin, with a population of more than forty millions.

In outlining the main line of exploration toward the interior of the "Dark Continent" only the most succinct account is possible. For compasses of statement explorations are treated under five general heads: First, trans-Saharan, from the Mediterranean; second, the Niger regions; third, the lake regions near

Zambezian region and, fifth, the Congo Basin.

According to different definitions of a desert the Sahara varies in area from 2,500,000 to 3,500,000 square miles, of which the eastern third is generally known as the Libyan Desert. Hitherto this desert area, with scant water, intense heat and whirling duststorms, interposed an inaccessible barrier between the Hesperian nations of the Mediterranean coast and the negro tribes of the Sudan.

SAHARA'S BARRIERS OVERCOME

Explorations of the Sahara were fruitless until Chodrey, Denham and Clapperton crossed (1822-'24) from Tripoli to Lake Chad, in the Sudan. Laing, following, crossed from Tripoli to Ghardames and Tiat to Timbuktu, the mysterious city of strangely exaggerated importance from previous centuries. Lanct, Vincent Duveyrier, and Lemaire explored the desert between Senegal and southeastern Algeria.

It was Barth who gave the first definite account of the Saharan region after a journey of great extent and importance. Starting from Tripoli he crossed the Sahara to Lake Chad, passed Northern Hausaland to the Niger at Say and thence reached Timbuktu. Returning northeast through Sokoto to Ankawa he explored Darou. Barth's journeys were of great value, for he not only made

known to the world the existence and accessibility of hundreds of thousands of square miles of fertile territory but he also gave in five volumes a tremendous amount of geographical information in which he treated quite thoroughly the ethnology of the various tribes of the Central Sudan. His successor, Kuhn, after exploring Southern Morocco, penetrated the Sahara to the bases of Tomba.

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The Sahara, instead of being a low desert of marine origin, is an elevated plateau, which has been enormously denuded by the disintegration of its rocks through temperature changes and the distillation of its dust by high winds. It is not so level as it seems; has many fertile oases and only needs abundant water to produce luxuriant vegetation.

The first Europeans to cross Africa from east to west were a lot of the empire were Maurel and Massari, who traveled from Suakin and Kordofan, Wadai and Kano to the Niger. Nachtigal (1869-'70) made a journey from Tripoli to Lake Chad to the Libyan Desert where he explored the remarkable mountainous region of Tassili. Examining the Lake Chad district, he reached Egypt at Wadai and Darfur.

NIJER AND NIGER ANOMALIES SOLVED

The mystery of the Niger long erroneously supposed to flow through the Sudan to the west, was partly solved by Mengo Park, who, starting from Famine, in his first journey reached Segou on the Niger. His second expedition (1865) ended in failure. Clapperton, renewing the survey, perished, but his faithful assistant, Richard Lander, definitely solved (1830) the mystery of the

Niger by descending from Russia to the mouth of the stream.

French energy has explored Senegal and Gambia by the journeys of Ruffinot, Mollen, De Meurville, and especially Chérols.

The great mystery of the Nile source after twenty centuries of speculation has been solved by the efforts of our own explorers, most largely by Baker, Speke and Stanley. Its largest lake source, Victoria Nyanza, was discovered by Speke, who missed Albert Nyanza. Baker discovered the source of the Blue (Abyssinian) Nile and the Albert Nyanza of the main or White Nile. To Stanley belongs the honor of the discovery of the remotest source, Albert Nyanza, which feeds the Albert Nyanza through the Semliki.

Albert Nyanza, which feeds the Albert Nyanza through the Semliki.

The tabled Mountains of the Moon have given place in Eastern Africa to a most remarkable moisture system. The vast equatorial lakes cover extensive regions, feed some of the largest rivers of the world, and by their transportation facilities favor commerce. Their central situation between the Cape and Cairo, convenient to the Indian Ocean and on the confines of the Congo Basin caused them to be recognized as the central key to African domination by Germany and Great Britain, who now control the region.

The largest lake, Tanganyika, was discovered by Burton, while Livingston contributed Nyassa, Moero, Bangweulu and others. Joseph Thompson exploring south from Tanganyika, discovered Lake Kwana and also traversed the unknown M'bat and

ANALYSIS OF HIS GREAT WORK

The discovery of the equatorial lakes was of subordinate import to that of the Congo Basin, which grew out of the secondary lakes in South Africa. To the genius and energy of two men, David Livingstone and Henry M. Stanley, are

primarily due the exploration and utilization of the vast unexplored regions of the Congo Basin.

Unquestionably the missionary Livingstone, who settled in Bechuanaland in 1841 and one of the greatest of African explorers. First discovering Lake Ngami, he turned his attention to the Zambesi Valley, and practically covered this basin in 1851-56, and later, in 1858-64, explored Lake Nyassa and the adjacent country. Most important results flowed directly and indirectly from the last journey of his life, in 1866-67, when, crossing the watershed of the very sources of the Congo, he discovered Lakes Moero and Bangweulu, the Lupaia and Lomaba rivers, now recognized branches of the Congo.

STANLEY

Stanley, who found the long-lost Livingstone, completed the exploration of the main Congo Basin in a journey (1874-78) which in its discoveries and results is unequalled in African exploration. His circumnavigation of the great lakes, Victoria Nyassa and Tanganyika was important, but the crossing to the watershed of the Lomaba, which he proved to be the Congo by following it to the Atlantic Ocean, was a journey of unsurpassed courage, persistence, and resourcefulness. His return to find the Congo State was followed by extensive discoveries, such as Lakes Leopold and Maricao, the Shari, Kasai and other affluents of the mighty river. Stanley's geographic labors were increased by his search for Emin Pasha, when he crossed Africa from the junction of the Congo and the Aruwi over the Bahr el Jebel and the desert. He discovered not only an extensive and almost impassable forest, but also the ultimate lake source of the White Nile, Albert Edward Nyanza. Stanley's exploration of the Congo Basin was a potent force, second only

to that of Columbus' discovery of America. Each explorer opened up a new continent, and gave rise to scientific and philanthropic schemes which affected the progress of the world.

Europe awakened to the importance of the Congo basin, with its great lakes, its ten thousand miles of navigable rivers, which leave no part of the basin one hundred miles distant, its fertile valleys, its animal life and vegetable resources, and its millions of inhabitants. Africa speedily became the center of commercial expectation which was not confined to private enterprise. Most unfortunately, by act of international conference the Congo Free State, with an area of nearly a million square miles, became independent, presenting the greatest natural possibilities, it practically bears, in interest and importance, the same relation to Africa as does the watershed of the Mississippi and its tributaries to the United States.

By rail and steam boat one may travel from the west coast, through the Congo State, more than half way across Africa. Its revenue is counted by tens of millions of francs, its exports and imports increase steadily, and, apart from the enormous inhabitants of the French Congo, it has a population of 30,000,000. The effect of the geographic evolution of Africa upon Europe may be estimated by the statement that Belgium in its relations with the Congo State deals with a country whose area is one hundred times its own and that of the 10,500,000 square miles of Africa all but 400,000 are European dependencies.

OCEANOGRAPHY A NEW ART

As to oceanography, a development of the nineteenth century, space only permits allusion to the work of Seeger, in the Gulf of Mexico; Carpenter, Thomson, and Norwegian savants in the North Atlantic, and Nares and Murray

in the *Challenger* expedition. The latter work, under Murray's supervision, has outlined the main features of the oceanic world for the twentieth century to explore and chart in detail.

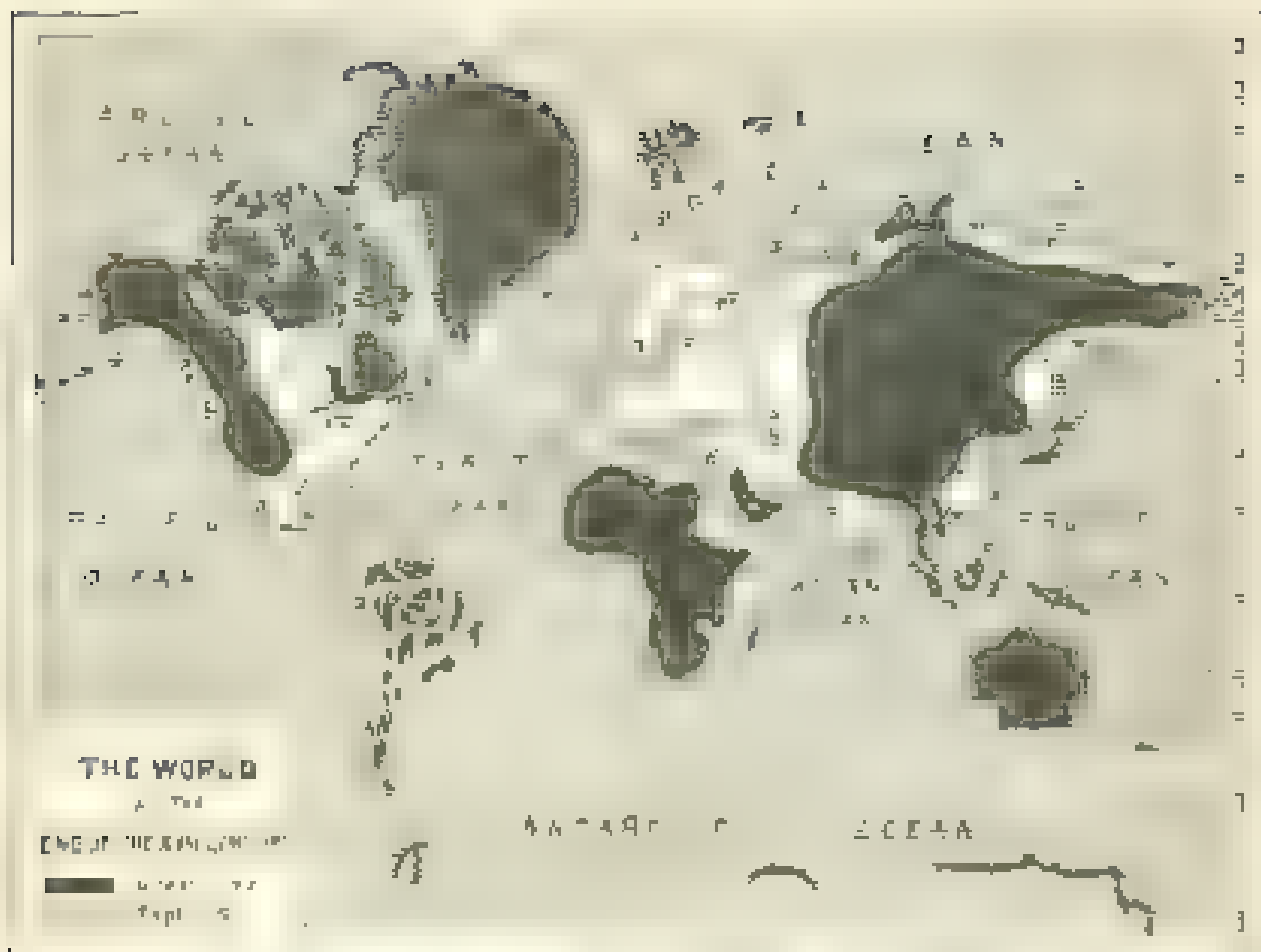
As to the twentieth century, it should be noted that pioneer discovery, yielding readily to scientific exploration. Future work will tend toward the outlining of existent and possible relations between man and his geographic environment. In this sense there remain numerous geographic problems whose satisfactory solution will tax many generations of scientific explorers. Such, for instance, are current investigations as to the accumulation of

the arctic regions of Australia and the United States.

Reverting to pioneer discoveries the twentieth century, despite increasing efforts of this age, inherits an extensive legacy of unknown lands. Exploration for exploration's sake was, for many years and ample scope in untraversed polar regions, Arctic and Antarctic, where the attainment of the Poles will continue to be large and the end in view.

Of unexplored areas West Australia now presents the most extensive, its vast desert having been examined only here and there along routes hundreds of miles apart.

While North America has for vaguely known districts only in Mexico and Central America, yet South America presents many fields of great promise to adventurous men. This is especially true of the eastern shores of the Andes in Ecuador, Colombia, and Brazil. In the western half of the drainage basin of the Amazon exploration has touched only the banks of navigable streams. Our knowledge is largely conjectural as to the extent and distribution of the forests and upland and of the existent connections of its fauna, flora, and mining interests.



VIRGIN LANDS Awaiting

Lives in Africa which for a quarter of a century has engrossed the zeal and energy of explorers, there is much yet to be made known and charted. Not only is there great work to be done in the Libyan Desert and the Central Sahara, but even the country of the Foutas in Western Sahara needs thorough exploration. South of Abyssinia and east-west of Lake Rudolf is almost virgin ground. The most interesting areas are the primeval forests in the basins of the Congo and Amazon. These regions are penatrasms which endeavor to reveal to the world their fauna, flora, and ethnology, and endeavor to correlate information on the pages of Du Chaillu, Stanley, and Schweinfurth.



Asia. Last advances may be expected as to Atalpa Peninsula, Borneo, the Malay Peninsula, and especially the Philippine Archipelago. In the last-named region the almost untraversed islands of Mindanao, Malacca, and Palawan will soon yield to the energetic and intelligent explorer the long hidden secrets of nature as to their fauna, flora, and capabilities of service to mankind in general and to the United States in particular.

MEXICO OF TODAY

BY DR. J. J. HARRIS, JR., U. S. GEOLOGICAL SURVEY

MEXICO IN NEW YORK CITY

MY object in preparing this paper is to present to the members of the National Geographic Society and to the readers of its journal some well ascertained facts about the Mexico of today and the many material and commercial attractions which make it one of the best places in which to invest capital with security and the prom-

ise of a speedy and splendid return. Before entering upon my subject I wish to state that my words and opinions are made on my own responsibility, and are in no sense semi-official. In speaking of my own country I can hardly be required to be impartial in my opinions, but in the statement of facts I shall endeavor to give not only my own private

Other reports on the subject to geographic knowledge during the past one hundred years.

Progress of Commerce during the last half-century.
Report of the Secretary of the Interior on the

The Map 1897.
The Journal of the Secretary of the Interior, March 1897.

A Letter of Explanation. By the Secretary of the Interior. The War of Work. January 1897.
The Congress of the Nineteenth Century. By Angelo Del Boca. The N. Y. Evening Post, January 12, 1900.
The Report of the Secretary of the Interior. By the Secretary of the Interior. Washington Magazine, March 1897.
The Political and Social Science Review. London, 1897.

judgment, but the opinions of persons and newspapers who have nothing to do with the fear from Mexico.

One year ago I knew by sight a tourist who went to Mexico City and stayed there exactly a week, not knowing, of course, a single word of Spanish and on his return home published an article on Mexico, relating all his remarkable experiences in the country, among which was an attack by a band of robbers on a stage coach where he sat, and a lion man was roving. The captain of the stage told me nothing other than a black-eyed deaf man who pretended the dangerous and unusual vocation of highway robbery. All these adventures were very entertaining and their only fault was not to have any existence except in the fertile imagination of their reporter.

Within the past thirty years the means of transportation have wonderfully increased. Instead of sailing vessels and a steamer every three weeks, there are now two regular steamers every week on many "tramp" steamers, and by land we have four railroad lines connecting the two countries.

The configuration of the land of Mexico is very peculiar. Toward the coast it is very low and very rapidly to the interior, until an altitude from 5,000 to 10,000 feet is reached above the sea level, arriving at what is called the "table land."

Our capital, Mexico City, has an elevation of nearly 7,400 feet—that is to say, it is from 200 to 900 feet higher than the highest peak of Mt. Washington, which has a elevation of 6,200 feet. Although the city is only a little more than 19 degrees north of the Equator, it never experiences a tropical summer. That a light overcoat is needed in the evening at every season of the year is seldom appreciated by foreign travelers who, under the notion of visiting a tropical country, come provided only with summer clothing and thus often con-

tract diseases contracted upon exposure to the cold air.

Not a single navigable river traverses the whole country. This unfavorable natural condition has necessitated the building of many railroads at an enormous cost over the millions of dollars.

Our constitution is similar to that of the United States in the main parts. Mexico is a federal republic, divided into States and Territories; the former ruled by their particular constitutions, and the latter directly governed by the

appointed by popular election every four years, but as the constitution prescribes no limit to reelection, we all have had the pleasure and, in our opinion the good sense, of reelecting General Díaz for the fifth term, ending on November 30, 1911.

Perhaps some persons will not deem it in accordance with republican ideas to reelect a man so many times, but we Mexican citizens answer that if it is not in accordance with certain theoretical principles, it is in perfect conformity with that sense called *common* practice because it is so *done*.

The president of a republic is the attorney, elected by the citizens to administer for a certain period, under prescribed rules established by the constitution, their foreign and internal affairs. If we

imposed upon him with retrospection ability and honesty, as we Mexican citizens believe, a man of that kind cannot be very easily found, we renew our power of attorney for another four years, leaving intact the most severe maxims of republicanism.

This custom of continuing as long as possible those public officers who for the performance of their duties require a certain amount of technical education and experience is very old in Mexico. Even in the times when political parties waged terrible war upon each other causing frequent changes of administration,

many officers who by their competency and honesty seemed to all to be the right men in the right places were left without them.

If we entertain an elevated opinion of Mexico, that we only agree with what the press of every country, from London to Spain and from Cape Horn to Washington, declare when they assert that Mexico is one of the most prosperous and best governed countries in the world.

Our constitutional laws differ from those of the United States in denying the right to religious corporations of any denomination to possess or administer real estate and to hold any mortgage upon real estate. In consequence the property of such corporations must be in cash or in shares of railroad, telegraph, manufacturing, mining or some other kind of enterprise which keeps their money in constant circulation. The object of this legislation was to prevent the stagnation of real estate constantly produced by those corporations having two characteristics— indefinite duration and possession in common—not any of their members being able to dispose of any part of the property, as is the case in mercantile associations.

Another point worthy of mention is the disposition of our fundamental laws relative to marriage. Our legislators considered marriage as the corner-stone of the social edifice and consequently they did not leave it to the legislatures of the States, but prescribed precise and unchangeable rules as to its time and form of contract.

In short, they considered marriage a civil contract constituted by the inseparable union of a single man to a single woman and requiring for its legal validity, but to be contracted before a civil magistrate appointed for the purpose. Of course, the laws do not prevent the contracting parties from having religious or other religious ceremonies and this is the reason why in Mexico all marital ceremonies are double—one

of a religious and the other of a civil character.

Some lawyers say that it is not convenient to hinder or make marriage a little difficult, but others answer in the affirmative, that it is better to encourage men and women to practice it known, or, verb, 'Look before you leap,' or, as

say in Spanish, *¡Pasa que te enredas en lo que haces!* 'Be sure you get untangled think of what you are doing.'

Divorce is absolutely rejected, though legal separation is allowed with the formalities prescribed by said laws.

The public administration of Mexico is divided into seven departments: Foreign Affairs; the Interior; Justice and Public Education; Improvements and Industry; Commerce and Colonization; Communications and Public Works;

Finance and Public Credit; and War and Navy.

The Department of Foreign Affairs maintains amicable relations with all the countries of both hemispheres. Today Mexico has not a single cause of disagreement with any power or people in the world.

One of the principal objects of the Department of the Interior is to create cordial relations between the Federal and State authorities. There was a time when it was every State governor or assembly as he believed it to be his duty to oppose in every way the Federal Executive, and even some of them maintained a large military force, not to keep peace and give public security, but in order to resist any force if necessary the orders of the Federal Executive. Those narrow-minded and narrow-bred ideas are things of the past, and General Díaz, in his last report, repeats with patriotic pleasure that not a single State has any difficulty or disagreement with the Federal authorities or with any of its neighboring States and that all the governments try to act in perfect accord with the Federal Executive to give an impulse to the continual progress of the

with the country. In other words, they are sufficiently enlightened to avoid the severer of the reasonable suggestions by the constitution to administer their internal affairs as a republic; that they are only members of that great may encompass the Mexican Republic, the only sovereign in the true and correct sense of the word.

The board of health is a branch of this department, and the Federal Executive and all the States devote to it special attention. In the City of Mexico a general hospital will be completed very soon where 22 isolated pavilions have already been finished and where

hygienically, and scientifically cared for.

The States have followed this example, and many of them have finished or are in actual construction of or institutions based upon the same scientific principles.

The efficacy of the measures taken by the board of health in regard to vaccination and the prevention of smallpox has received the amplest confirmation from experience. In 1898 an epidemic of smallpox broke out in different parts of the country and in the City of Mexico. The total number of deaths was only 78, the great majority being foreigners who had not taken the precaution of being vaccinated.

We have another institution in excellent condition in the Federal district; that is the police. The whole force is divided in two large sections—the city or urban and the country or rural police.

The greater part of the first consists of foot men, with a small squadron of mounted police, while the second or rural police is exclusively composed of mounted men.

The distribution of the city police is, in the opinion of many natives and foreigners, perfectly organized for public protection. There is always a policeman stationed at the crossing of every

street and square, and misdemeanors and crimes can often be prevented and the criminals almost always caught. In general, the policemen are courteous and ready, not only to help when called on to give assistance and protect and aid—useful to every body. The services rendered

persons especially foreigners, who with the best intention have tried to give them a voluntary reward for the recovery of lost goods, can testify that the reward has never been accepted in any

circumstances. It makes the important observation that we make statistical tables prove that it is not criminality that has increased but rather the efficiency of the police.

The rural police, who guard the roads of the country in general, are formed exclusively by mounted men picked from the best recruits of the Republic and are mounted on splendid horses. Their courage, by reason of their efficiency and want of ignorance always attract the attention of the spectators.

Places for the correction and punishment of criminals, or penitentiaries, are being built throughout the Republic according to the systems proven best by experience, and are all founded upon the philosophical and truly Christian idea of the society when it takes hold of a criminal, does not intend to wreak vengeance on him, but to prevent him from repeating his offensive acts and to reform and convert him by every possible means into a good and useful citizen, and, at the same time, to deter others from following his example.

Let us now glance briefly over two of the most important foundations of any Republic—and, more especially, of a Republic—the department of justice and public education.

The Federal and State authorities are constantly trying to perfect the administration of justice and to elect able and honest citizens to the judges' positions.

constitution, like yours, decrees that the judicial authorities must be elected by popular vote, and these elections are held in the most tranquil way. My own personal opinion is against this manner of appointing judges and magistrates.

the best qualification for the sacred duties of a judge.

The importance of public education is fully appreciated by the Federal and State authorities, and there is a complete system derived from the study by competent persons of the methods followed in foreign countries. The Federal government has not only adopted the systems considered the best, but has appointed boards of education to give to public education an impetus in the right direction and to make it efficient in the Republic.

In 1904 the number of schools in the Republic was 12,348, and of this number 6,715 were supported by Federal and State authorities, 2,957 by municipalities, and 2,667 by private parties. The average monthly attendance of pupils was 540,000. The expense of the established schools supported by the authorities amounted to \$4,980,180.72 not including the schools kept by private parties, of which I have no information.

In comparison the cost of the schools paid by the authorities, we can calculate very approximately that \$7,000,000 were expended for public education in Mexico in that year. The number of schools for girls was 3,276; for boys, 5,813; and in total, 2,249. This total has certainly increased since then.

The attendance of pupils in the primary schools at the present time is 1,000,000 per year, and I was surprised to find that in the United States after an absence of thirty years to observe the wonderful results attained by our educational system. There is yet much to be done, but what has been already accomplished is truly surprising, and the word of education is con-

stantly improving and multiplying the means of instruction.

To train good teachers and to impress unity of method there are normal schools for men and women. In the normal school for women in the City of Mexico there are actually more than 1,000 girls who want to adopt the noble profession of teachers. Another excellent normal school exists in the State of Vera Cruz, and there are others in other States, but I have no data at hand concerning them.

For professional courses there are principally in the Federal districts schools of jurisprudence, engineering in all its branches, commerce, agriculture, arts and trades. The arts, one of the objects of music, and for education required by the actual state of sciences and arts, and the government is continually giving to each one of these a special means conducive to perfect instruction, beginning with a comfortable and hygienic building. The case, for instance in use by the school of arts and trades for women has been extended because the actual attendance is more than 1,000.

The National Library in 1904 was 130,000. The National Library of the capital last year added to its catalogue nearly 10,000 volumes by purchase and 9,500 volumes by the donation of Mrs. Isabel Pesado de Mier, widow of our late and lamented minister to the French Republic, Mr. Antonio de Mier y Celis, my near friend, and one of the best and most patriotic citizens Mexico has ever produced.

The number of museums in the Republic is about 30. The National Museum of the capital the richest of all, received last year valuable additions in the requisition of a complete and archaeological objects from the State of Michoacan, a collection of antique objects from the Indians of Tezontepac and Huasteca, and of the codices existing in the European collections relative to our history, dated

by the Bishop of Tehuantepec and the *Diócesis de Tehuantepec*.

The newspapers published during last year numbered 533, and of that total 153 were published in the City of Mexico, among them being daily, weekly, monthly, and quarterly journals. Very few fortnightly, were exclusively given to politics, the rest to the exposition and discussion of science, industry, commerce, agriculture, jurisprudence, medicine, political economy, mining, agriculture, engineering, or literary art, etc.

These few facts, rapidly enumerated, will give some idea of the real state of the public education in Mexico.

Passing to our Department of Improvements, Commerce, and Industry, etc., our mining industry is the most important in every respect and deserves to be mentioned first. The number of mineral properties at the end of last year was 12,74 covering an area of 126,381 hectares, the equivalent of nearly 300,000 acres, besides six extensive zones in the States of Sonora, Chihuahua, and Michoacán and in the territory of Lower California which were rented to parties under contracts made by the Executive and approved by the Federal Congress for the working of all mines that may be discovered in these tracts of land.

The yield of our silver mines in the four years from 1897 to 1899 was \$2,247,457, or a yearly average of \$561,166. During the four years 1896-1900 the production was \$274,370,147, a yearly average of \$68,592,540. Our production of gold is also increasing. From 1892-1895 it was \$14,123,877 and from 1896-1900, \$21,608,475.

The output more than doubled during the last four years.

In the production of silver from 1890 to 1900 there was a decline of more than two millions of dollars. But General Díaz explains the cause very satisfactorily by recalling the instability of pro-

duction, which is subject to many accidents and unforeseen circumstances that diminish or stop suddenly the output of a mine or mines. Our mining enterprises are not now confined to silver alone, but to the mining of many other metals such as copper, antimony, lead, and mercury, large capital is employed.

Our exports of copper in the last three or four years amounted to nearly ten millions of dollars. Some of our mineral yielding establishments have disposed of the following quantities:

Campaña Metallurgica Mexicana de San Luis Potosí, from December, 1896 to September 30, 1899, 312,358 tons.

Cerro Prieta Central de Aguascalientes, from December, 1896, to October, 1899, 625,853 tons.

Compañía del "Holeo" de San Calixto, in the years from 1896 to the end

A department of vital importance to us is that of colonization. Formerly the government made some efforts in this direction, and we now have mines in steady progress, 13 established directly by the government and 16 by private companies. Experience has taught us, however, that it is better to leave this matter to private enterprises, and the only posture aid given by the government is the tranquillity, security, and incessant and rapid progress of the

When these advantages become universally known the current of immigration will flow into Mexico, where not only can starve, while the poorest, with some exertion, can arrive at a comfortable situation. The middle class become rich and the rich can increase their capital by numbers, and all this with a beautiful climate, salubrious everywhere, except on the coast, and among a peaceful, industrious people, who have well earned the reputation of being one of the most courteous and hospitable portions of the earth.

To be continued in the May number

GEOGRAPHIC NOTES

OFFICIAL INFORMATION RELATING TO THE PHILIPPINES

The published three handsome volumes on the Philippine Islands. The first two volumes are a history of Spanish work in the archipelago, with a novel graphic statement of the resources of the islands. The different peoples, their means of livelihood, their customs, and character are sympathetically portrayed by the editors, Rev. Jose Algué and the Jesuit Fathers of Manila. The third volume is an atlas of about 60 colored maps. The collection of the material has been the work of generations of the Jesuits. At times the Spanish régime wanted money and prevented the publication of the mass of facts obtained. The map-makers of the U. S. Coast and Geodetic Survey have systematically the material which the Jesuits supplied. Volumes I and II are in Spanish and illustrated with very good pictures. The set of three volumes may be obtained from the State Department by the payment of \$20.

The Reports of the Taft Philippine Commission, which form a volume of two pages, may now be obtained from the State Department gratis.

The War Department has recently issued a large map of Luzon on the scale of 1:100,000 to the inch. It embodies all the latest information received by the department from its officers and agents in the islands. The department has also printed a third and revised edition of the large map of the archipelago based on the map of Moroto Y. Gay, first published in Madrid.

The latest edition of the "Progress Map of Signal Corps Telegraph Lines

and Cables" on the Philippines shows all lines laid by the corps up to February 1, 1901. The lower half of Luzon is now covered with a network of wire while two trunk lines penetrate to the extreme north end of the island. The islands of Panay, Cebu, Negros, Iloilo, and Bohol each have several lines of lines of wire constructed by the corps and are connected by military cables. There are now in operation on the islands 9,000 miles of wire and 100 miles of cable.

These maps may be obtained by request from the press as gratis.

THE CENSUS OF INDIA

THE CENSUS of India taken March 1, 1901, gives the population of that vast country as 294,700,000, an actual increase of only 1.49 per cent during ten years, while during the preceding decade the increase was 11.2 per cent.

The population in 1891 was 287,217,000, but as certain tribes are included in the census of 1901 that were not enumerated in 1891 the net increase is only 4,283,000. In numbers India has thus added to her population less than one third of what the United States have gained, though she has increased four times the population of the latter—an increase of four millions as against thirteen millions for the United States.

The reasons of this small increase in the figures are two: first, the terrible ravages of the plague for four consecutive years in the Bombay Presidency and the two great famines of 1876-97 and 1899-1900; and, second, the greater scarcity with which the work of the census has been performed.

The population of British India has increased considerably, while in the Native States it has fallen off. In 1881

India now numbers 231,000,000 and was 211,366,000 in 1901, and the Netherlands, 64,181,000 and 60,000,000 in 1911. It is yet too early to analyze the returns for the Native States, but these would appear to be an excessive increase in the birth rate.

The following table gives the population in thousands, the third column showing the percentage of increase or decrease.

[illegible]

GEN. FOSTER ON MEXICO

HON JOHN W. FOSTER has been contributing to the *New York Tribune* a series of very pointed papers on the condition of Mexico of today. General Foster began his distinguished diplomatic career in 1834 as the United States Minister to Mexico, where he represented his nation for seven years. Until this winter he had not revisited the country in the twenty years since his term. In the meantime he has been the United States Minister to the courts of Russia and Spain and held the highest diplomatic office in the United States—that of Secretary of State.

Instead of geographic isolation, Mexico is now linked to the United States by the iron ties of four railroads, while many steamship lines ply between Vera Cruz and foreign ports. Security of life and

erty is now assured. The evidences of progress and prosperity are seen on every hand. Mexico, the capital city, has doubled in numbers, and in its conveniences and wealth bringing attractions may vie with the great cities of the continent.

the respect of us, on one feature of the recent diplomatic relations of Mexico has been the execution of these relations to the far east. Several years ago a treaty of amity and commerce was effected with Japan, and missions are now maintained at the two capitals of both governments. Last year a treaty of a very liberal character was signed at Washington by the Mexican Ambassador and the Chinese Minister. As Chinese laborers are admitted into the country, and they are already coming, especially to the Pacific Coast, in considerable numbers, and by their industry and persistence they are making themselves felt as an important element of the country."

To the nearest millivolt of mV as 1 v

President Diaz Mr. Foster attributed the prosperity of the country. The result of the President's good judgment is especially evident in the present confidence in the financial condition of the country, both official and private. "The revenues which before the election of General Diaz had been barely \$20,000,000 annually, were doubled then trebled, and within ten years had increased more than sixfold, reaching as high as \$120,000,000.

This increase made possible the abandonment of the old system of taxation of goods passing from state to state and of taxes collected at one city gates on all articles of consumption entering the city. By this reduction in the branches of taxation the national revenues have diminished to \$60,000,000, which is sufficient for all the current needs of the government, and yet a surplus to be applied for special purposes.

The entire indebtedness of the Republic amounts to a sum of \$177,178,000, borne by about 13,370,000 souls. Mexico's debt *per capita* is therefore \$13, while that of Canada is \$71.

EXPLORATION DURING VICTORIA'S REIGN

A PERUSAL of Gen. A. W. Greaves's able article shows that nearly all the enormous advances in geographic knowledge during the past 40 years were made during Queen Victoria's reign. In 1847 Livingstone was attending practical and Greek classes in Glasgow, and Stanley had not been born. Victoria had reigned 16 years before McClure, in 1863, attained the Northwest Passage, and 43 years before Nordenskjöld, in 1880, solved the problem of the Northeast Passage. Sir James Ross, Wilkes, Weddell, and De Kay all won their Antarctic laurels within her reign. Australia was not crossed from north to south by Stuart in

1862, 23 years after her accession, and from east to west by Colonel Warburton till 1873, 36 years after her accession.

But, the explorer of Tibet; Pungkeo and Kichiboten, pioneers in China; and Nevsky, who ascended the Amur from the sea, gained their fame within Victoria's reign. Fremont Powell Hall names contributions in the exploration of the American continent—of which I do not work since 83.

From her accession Victoria was Patron of the Royal Geographical Society, and to her encouragement are due many of the great enterprises planned and successfully carried out by the Society. She was ready also to reward the work of British explorers. James Ross, Leopold McClintock, John Frankland Samuel Baker, Robert Schomburgk, Henry M. Stanley, and others, were knighted in recognition of their achievements. The Founder's Medal and the Patron's Medal awarded annually by the Royal Geographical Society, were granted by her.

PHENOMENAL INCREASE IN POPULATION OF ITALY

THE population of Italy has practically doubled in the last twenty years, a rate of increase that surpasses that of all nations of Europe and even the United States. Thus, too notwithstanding the burdens of excessive taxation, that would tend to diminish the birth rate. The last census was taken twenty years ago, in 1881, and showed a population of 21,000,000.

According to the census taken early this year the population now numbers 40,000,000. It is safe to estimate the number of emigrants during the twenty years as at least 5,000,000, so that the increase by birth has been about 25,000,000. It has taken the United States thirty years, aided by 12,000,000 immigrants, to double its numbers.

U. S. COAST AND GEODETIC SURVEY

FIFTY-FIVE young Filipinos will soon be selected by civil service examinations in Manila as aids in the U. S. Coast and Geodetic Survey. They will probably be brought to the United States for a preliminary training at the head office in Washington before being assigned to active work in charting the rivers and harbors of the islands. They will be paid \$520 a year, a very generous salary in the Philippines, and clever young Filipinos will undoubtedly be secured. The experiment, suggested by Dr. D. H. Mahan, superintendent of the Survey, is of great importance, as it is the first step to interest, train, and identify the young Filipino in the scientific development of his country.

The coast of southeastern Alaska has been well charted by parties of the Survey during the past several years, but the approaches to this section have remained unexplored. This summer the *Yoth* and *McArthur*, in charge respectively of J. J. Abbott and E. Westdale with early survey parties to these channels and soundings will be taken to accurately determine them. A large party will work in Prince William Sound while several vessels will carry other men westward to make the difficult problem of charting the many channels between the Fox Islands of the Aleutian archipelago.

GLACIAL ACTION IN AUSTRALIA

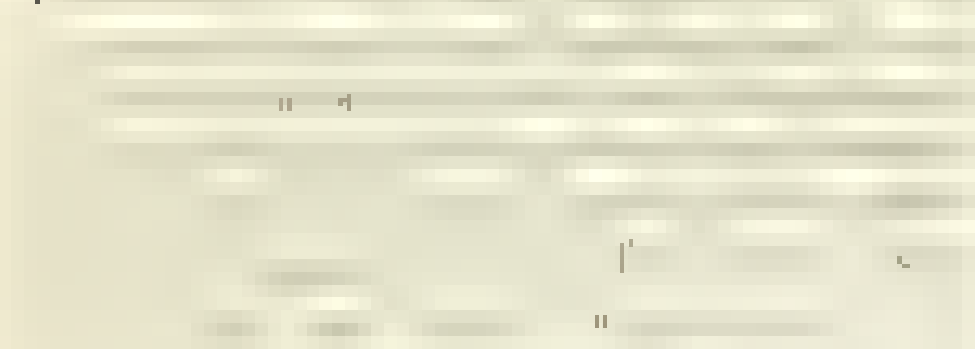
THE evidences of glacial action in Australia during Tertiary-Carboniferous times are discussed by Professor Penck in the *Zeitschrift* of the *Deutscher Gesellschaft für Erdkunde* and compared with traces of similar action in India and South Africa. The hypothesis of a shifting of the South

Pole to a central point on the tropic of Capricorn, in longitude 86° E., does not satisfactorily account for the geological facts and the existence of glacial conditions over such an enormous area. Professor Penck is quoted in *Nature* as saying that the appearances ascribed to ice action present in each case certain features not characteristic of ordinary glacial deposits, the deposits are stratified and the pebbles are faceted in the manner first described by Wythe. He further observes that the Gondwanic beds, always closely associated with these boulder deposits, have lately been found in the Argentine Republic, and he compares the bedding and faceting with conditions induced by pressure observed in the Nagaiak and in certain localities near Vienna. While many of the observed facts appear to indicate glacial action, still he thinks that these special forms demand an investigation.

THE NORTHWEST BOUNDARY

IT is well known that the boundary between the British possessions in North America and the United States from the Lake of the Woods westward to the Pacific Ocean was long a matter of dispute. Everyone knows, too, that after the controversy had given rise to threats of war the 49th parallel was agreed upon by both governments as the dividing line. So, as represented upon our map, the whole question seems settled. Nevertheless there are many persons along this line to whom nothing settles whether they are living in the territory of the King or of the United States. During 1828-76 a joint commission erected 383 boundary monuments along the line about two miles apart, but they usually proceeded farther west than the rocky mountains, and left the 400 miles between the mountains and the Strait of Georgia almost unmarked. To survey

and mark out the far northwest boundary an expedition is now being organized by the Geological Survey at the University of California.



part shown.

Rockes and Cascades, where impassable streams and lofty cliffs make direct advances impossible. The necessary surveys will require three or four years.

After the work is completed it must be approved by a treaty between the British and American governments, describing in detail the location of this part of the northwest boundary and the monuments by which it is indicated.

Mr. E. C. Barnard, the well-known topographer of the U. S. Geological Survey, will run the line, in cooperation with Mr. C. H. Smith, of the Coast and Geodetic Survey. Messrs. Walter Willis, F. L. Ransom and G. O. Smith accompany the party as geologists to study the geology of the country in the vicinity of the dividing line.

SUSPENSION RAILROAD IN GERMANY

A SUSPENSION railroad of cable construction has recently been opened at Lohrstadt, in Germany. It is about eight miles in length and runs through the towns of Lohrstadt and Korbach, following the course of the river Wupper. The up and down tracks have only a single rail apiece, supported by an iron framework of a kind not yet known in railroad engineering. Each car hangs from two supports 25 feet apart, fitted with double wheels, which run upon the overhead rail. These supports are so shaped that it is believed to be impossible for them to leave the

line, even though an axle or a wheel should break.

The motive power is electric, supplied by a wire attached to the rail. Each pair of wheels is operated by an electric motor controlled by a motorman in the front car. The railroad is the invention of the late Herr Eugene Langer, of Cologne, who died in 1895. The chief advantage claimed is cheapness of construction, for the line can be built over public roads and rivers, where no ground need be purchased.

CAPE TO CAIRO TELEGRAPH

WORK is progressing on the telegraph line from Cairo to the Cape, although little has been heard about it of late, owing to the war in South Africa and the great distance from civilization the engineers have penetrated. The line of poles and wire now stretches 3,000 miles up from the Cape to a point 30 miles north of the mouth of Kasanga, on the shore of Tanganyika in German East Africa. Only 1,200 miles remain between Kasanga and the southern end of the Egyptian telegraph line. This last link will be traversed more easily, as the apparatus and supplies can be brought by water—steam or by native porters. Porters have to be continually engaged, as the men refuse to go more than a few hundred miles into their homes. Horses, mules, and cattle cannot be employed, as they cannot survive the heat of the wilderness.

The country just traversed between Lake Tanganyika and Salisbury is the hardest bit of ground to be met with, for it is mountainous, nearly wooded, and a gorges. Mr. L. S. Grogan, the explorer, reports having seen engineers supervising the work from attars whose track led fever at the aneroidometer standing at 10,000 feet.

The roughest and the worst road for

Matabebes which followed also delayed the work. The Matabebes misunderstood the white man's motive in killing their apparently well-cared, fat which were really infected with the disease and to revenge the drowning of telegraph poles and melted his wire into bullets, which they fired back at him. In this war \$20,000 worth of the company's supplies were destroyed.

They have had less trouble than was expected from wild animals, sometimes to be sure elephants have knocked down the poles, and once a lion helped himself to a liver before he was killed.

GERMAN SUBMARINE CABLE SYSTEM

A VAST system of submarine cables is being projected by Germany. In October, 1910, a line was connecting Kiaocheou with China, and the southern end is now being rapidly extended to Shanghai and Canton. Later a branch cable will be laid from Kiaocheou to Nagasaki to connect with the American Pacific cable, which is destined to be soon constructed, while the main cable will be continued to Macassar, Borneo, New Guinea, and the Caroline Islands. From the Azores a line will be laid southward to the Cape Verde Islands, thence down the Atlantic to the South American continent to Brazil, Rio de Janeiro, and Montevideo.

On the other side of the Atlantic a German cable will unite Morocco, Guinea, the Cameroons, and German Southwest Africa. When the construction of the system has been completed, the German emperor will be able to communicate with his possessions in every quarter of the world, independent of English lines. His messages will cross the Pacific and American continents on American cables and the Atlantic on the German New York-Azores-Brazil line, completed last year.

GREAT BRITAIN IN THE YANGTZE VALLEY

THE decay of British influence in southern China during the last five years. It is not merely that British influence has declined, but that the influence of other powers has largely developed in a region supposed to be distinctively the British sphere. Says the *Shanghai Courier*:

"A correspondent of the *Times* in a recent letter: 'The Yangtze is steadily growing less and less English and more and more international.' He fortifies this statement by discouraging facts observed in Shanghai and Hankou, 'the key of the Upper Yangtze.' He says: 'The one advantage we still possess over the other powers in the Yangtze Valley is the confidence and good will of the native classes among the peoples and officials of central influence in the Yangtze Valley, as to the rest of China, is relatively to that of other nations, not an increasing but a steadily and rapidly diminishing quantity.'"

Sir Archibald Geikie, who retired in March from the head of the British Geological Survey, was born in Edinburgh sixty-six years ago. His whole life has been spent in geologic work. When barely thirty he was appointed director of the Scottish Geological Survey, and later held the chair of geology in Edinburgh University. In 1881 he was chosen Director General of the Geological Survey of the United Kingdom, and ten years later was knighted in appreciation of his work. James Geikie, whose name is perhaps better known in America, is the younger brother of Sir Archibald. A J. H. Murray, the well-known authority on geological subjects, has succeeded Sir Archibald Geikie as Director General of the British Geological Survey.

An Austro-Hungarian floating exposition leaves Trieste in May for a months' voyage around the world. It is deemed impracticable for more than one ship to take part in the enterprise as the trip is an experiment. New York, San Francisco, Yokohama, Shanghai, Singapore, Batavia, Calcutta, Madras, Aden, and Suez will be visited. Parties that send exhibits are charged \$1,000 for each person and \$300 for every cubic meter of space or per ton weight.

U. S. Weather Bureau.—After July 1 this year the number of forecast districts of the U. S. Weather Bureau will be increased by the addition of Boston, Cleveland and Denver as centers of new districts. The United States is now divided into four districts, each with a center at which the forecast for the particular district is made. These centers are San Francisco, Portland, Oregon, Chicago, and Washington. By the division into smaller districts greater efficiency will be attained.

An Earthquake Occurred in Spain on February 10, which did considerable damage in Gataleta, a town of 10,000 inhabitants located in a hill district of the province of Cadix, about 70 kilometers, nearly due north, from Gibraltar. Several large buildings, factories, a mill, as well as the church of St. Joseph, were severely injured. Donor Augusto Arcenas, writing to *Asíetec* from the Central Meteorological Institute of Madrid, says that the heavy rain which provided motive power for the machinery in one of the factories has disappeared.

British Yukon Telegraph.—It has been stated with apparent certainty that the two British parties constructing the telegraph line from Quesnelle to Atlin, who are working toward each other, the first from Quesnelle northward and the second from Atlin southward, at the half-way point, instead of meeting, found

themselves on opposite sides of an impassable mountain range, sixty miles across. Atlin connects with the Canadian States line and, as Cape Nome, Dawson, and the military posts of Alaska, while from Quesnelle wires run to the great continental systems.

In Jamaica an African Language is

reservants of wild negroes who escaped from slavery during the early days of the slave trade. According to Maj. J. W. Powell, of the Bureau of American Ethnology, this language belongs to the Kongo region. The Maroons of Jamaica seem to be in a barbarous or semi-civilized condition, resembling in this respect our North American Indians, and like the Americans, they are confined to reservations, where they still preserve many of the customs and traditions of their savage ancestors.

The Recent Census of Vienna shows that in Austria, as in Germany, there is taking place a very rapid increase in city population, due in large part to immigration from the rural districts. Vienna has now 1,035,637 inhabitants, and has increased in population during the past ten years 23.9 per cent. Vienna now ranks fourth among the European capitals. London, Paris and Berlin exceeding her. London and Berlin are increasing at a faster rate. Of American cities, New York and Chicago out-rank Vienna in numbers, and each is increasing more rapidly—New York 37.8 per cent, and Chicago 54.4 per cent, in ten years.

The U. S. Board of Geographical Names held no meeting during March. By act of Congress a second edition is being printed of the volume containing all the decisions of the Board up to January 1, 1900. Copies of the report may be obtained by applying to Marcus Baker, secretary of the Board, U. S. Geological Survey, Washington, D. C.

GEOGRAPHIC LITERATURE

Newest England. By Henry Demarest Lloyd. Illustrated. 8vo., pp. 357. New York: Doubleday and Page.

Mr. Lloyd also traces the development of these forces in New Zealand, which have given pensions to the old and have made government monopolies of the land accident insurance, and also of railways and telegraphs. He describes the government and people as "the least, and this side of Mars"—i. e., they are not perfect, but no others are as good. The relatively enormous public debt, \$500 for each man, woman, or child, a *per capita* debt which in this country would run up to twenty-two billion dollars, and the consequently decreasing birth rate are two grave facts which Mr. Lloyd over-

An Old Indian Village. By Johan August Edén. Augustana Library Publications, No. 5. Rock Island, Illinois, 1904.

Although the author of this interesting brochure has no claim to special archaeological knowledge, his work may well serve as a model to local archaeologists throughout the great area covered by the Mississippi drainage system.

The scene of the explorations conducted by Professor Edén at intervals during seven years from 1881 in Paint Creek valley, a mile and a half south of Smoky Hill River in McPherson County, Kansas. The village remains consisted of fifteen low circular mounds from twenty to twenty-five feet in diameter without particular order of arrangement and covering an area of about twenty acres. The average height of the mounds was about two feet, while some rise only very slightly above the surface of the prairie.

Excavation revealed axes, hammers,

polishers, metates, mauls, flakers, pipes, knives, and scrapers of stone and bones, beads, gouges, and other objects of bone. Bones of numerous animals, fishes, and the wild turkey, as well as the valves of fresh-water clams, were also found during the excavations indicating that the former occupants of the site gained a livelihood by hunting as well as by agriculture.

Perhaps the most interesting object unearthed from the Paint Creek village—certainly the most interesting from the historical and geographic points of view—is the piece of clam shell illustrated in the volume, but unfortunately since lost. The definite origin of this relic of early Kansan exploration is not known, but as the field of Professor Edén's researches was unquestionably a part of the Province of Quivira, which the famous expedition of Francisco Vas-

which led to similar excavations into the same locality during the succeeding half century, the relic is in all likelihood of Spanish or Chin

The Province of Quivira was inhabited in the sixteenth century by the Wichita Indians who later occupied an extensive

while the name of the Wichita Mountains and of Washita River. They were the only Indians of the plains who lived in grass houses (such as Coronado's chroniclers describe as having been seen in the Quivira region), the Pawnees occupying earth lodges and other plans

may therefore assume that the Paint Creek village was made up by the corn-raising and buffalo-hunting Wichitas, as the relics would seem to show, and probably during the Coronado period, or at any rate during the time of one of the immediately succeeding Spanish expedi-

considers New Mexico as the fragment of a lost land tends to prove.

Altogether Professor Udlen's work is worthy of high praise. It is regrettable that "this will be his last as well as his last paper bearing on topics of this kind."

F. W. HUBER.

The Romance of the Earth. By A. W. Jackson. Illustrated. Small 8vo, pp. 151. New York: The Macmillan Co., 1901. \$1.00.

aims to describe the past and present con-

ditions of the earth. The author naturally has not adhered strictly to the limits of known science. Where human knowledge can throw no light, he permits himself "to speculate, to make deductions from the accepted laws of nature" in order that no chapters in the romance may be missing. The book is instructive and interesting and espe-

cially valuable to stimulate younger minds to learn more of the great "romance of the earth."

The Philippines—The War and the People. By Albert G. Kolben. 16 p. 497. New York: McClure, Phillips & Co., 1901.

The volume consists of letters written by Mr. Kolben to the *New York Evening Post* while he was staff correspondent for that journal in the Iliппines. Mr. Robinson is inclined to believe "the development of the islands would be impossible without the patient, submissive, industrious Chinaman," who is "a sort of necessary evil." The book contains

interesting chapters on the islands and their people, though it is doubtful if many Americans will agree with the author's pro-Philippine tendencies. Especially interesting chapters are, "The Moros of Mindanao" and "The Moros of Sul-

PROCEEDINGS OF THE NATIONAL GEOGRAPHIC SOCIETY

Popular Meetings.

March 7, 1901. President Graham held in the chair. Mr. Colman W. Latta delivered an illustrated address, "The Recent Past in India."

March 15, 1901. Vice-President McGee in the chair. Mr. H. L. Henshaw, Secretary of the Peary Arctic Club, and Dr. Frederic A. Cook of the Belgian Antarctic Expedition delivered illustrated addresses on "The Two Ends of the Earth: Peary and the North Pole, and The Cruise of the *Belgica* in the

March 29, 1901. President Graham held in the chair. Mr. Alexander Hume Brown delivered an illustrated address, "The Railway and Waterways of the Russian Empire."

* The proceedings of the popular meetings during March will appear in the next number.

Afternoon Meetings.

March 7, 1901. President Graham held in the chair. Talcott Williams, LL. D., delivered an illustrated address, "Western

March 22, 1901. President Graham held in the chair. Hon. John Barrett delivered an illustrated address, "Russia: Asia—China."

March 29, 1901. President Graham held in the chair. Prof. H. Morris Stephens, of Cornell University, delivered an address, "Southern

March 26, 1901. President Graham held in the chair. Prof. Howard A. Conway, of Amherst College, delivered an illustrated address, "Northern Asia—Siberia."

April 5, 1901. President Graham held in the chair. Vice-President McGee delivered an illustrated address, "Asia—The Cradle of Humanity."

Announcements.

THE ANNUAL MEETING OF THE SOCIETY will be held on Friday evening, April 12, in the parlors of the Arlington hotel. Mr. Paul Du Chaillu will be the guest of honor of the Society and will give some reminiscences of his travels.

A REGULAR MEETING OF THE SOCIETY will be held in the large hall of the Cosmos Club at eight o'clock Friday evening, April 19. All members resident in Washington are urged to attend, as important proposed changes in the by-laws, submitted and recommended by the Board of Managers, will be acted upon.

Object of Proposed Change in By-laws.

The Board of Managers submits and recommends to the Society important amendments to the by-laws. The proposed changes are so numerous that, for the sake of simplicity, the Board offers an entire set of revised by-laws to replace the existing by-laws. Members who wish to note in detail the modifications proposed can do so by comparing the draft which follows with the existing by-laws as printed in the *MAGAZINE*, Vol. IX, pages 414-416. The general tenor of the changes is set forth in the following paragraphs:

In an address read to the Board of Managers June 1, 1900, and printed in the *MAGAZINE* for October (Vol. XI, pages 401-408), President Bell advocated various changes in the policy of the Society, for the purpose of making its character more truly national. The revised by-laws now offered embody one of the more radical of these changes.

At the present time the Society has *active members*, residing chiefly in the District of Columbia, and *corresponding members*, residing chiefly in other parts of the United States. The dues of active members are five dollars, of corresponding members two dollars. Both classes receive the *MAGAZINE*; active members have in addition various other privileges, including that of attending lectures. Thus constituted the Society is not national in its active membership, but only through its corresponding membership. It is now proposed (1) to merge the grades of corresponding member and active member into the single grade of *member*, (2) to fix the dues for all at two dollars, (3) to treat lecture courses, whether in Washington or elsewhere, as local privileges, to be paid for by those who are benefited.

The proposed by-laws include many other changes which seem to the Board desirable if the general change in organization be adopted. The more important of these are (1) the enlargement of the Board of Managers by the

addition of members not residing in the District; (2) the creation of an Executive Committee for the transaction of current business; (3) the restoration of the fiscal year to coincidence with the calendar year; (4) the omission of section 5 of article IV, with reference to Managers who are continuously absent from meetings of the Board.

These include also a number of changes not specially related to the general change in organization. The more important of these are (1) the substitution of the single office of Secretary for the two offices of Recording Secretary and Corresponding Secretary; (2) the omission of the requirement that the Secretary and Treasurer be selected from the Board of Managers; (3) the making more stringent the rules with respect to arrangement of dues; (4) the reduction of the quorum of the Society from 25 to 20; (5) the provision that official notice of proposed amendments to the by-laws may be given through the *MAGAZINE*.

The amendments will come up for action at the regular meeting to be held April 19.

A. J. HENRY, Secretary.

Proposed By-laws.

ARTICLE I.—Name.

The name of this Society is *The National Geographic Society*.

ARTICLE II.—Object.

The object of the Society is the increase and diffusion of geographic knowledge.

ARTICLE III.—Membership.

SECTION 1. The Society shall consist of members and honorary members.

SEC. 2. Members shall be persons interested in geographic science.

SEC. 3. Honorary members shall be persons who have attained eminence by the promotion of geographic science. They shall not be members of the corporation, nor shall they vote or hold office.

SEC. 4. The election of members and honorary members shall be entrusted to the Board of Managers.

ARTICLE IV.—Officers.

SECTION 1.—The administration of the Society shall be entrusted to a Board of Managers composed of twenty-four members, eight of whom shall be elected by the Society at each annual meeting, to serve for three years, or until their successors are elected. Of the eight members elected at each annual meeting, not less than four nor more than six shall

be residents of the District of Columbia. A majority of the votes cast shall be necessary for election.

SEC. 2. The Board of Managers shall elect annually from their own number a President and a Vice-President, and shall elect annually a Treasurer and a Secretary.

SEC. 3. The President shall preside at the meetings of the Society and of the Board of Managers, or may delegate this duty. The President and the Secretary shall sign all written contracts and obligations of the Society.

SEC. 4. In the absence of the President his duties shall devolve on the Vice-President.

SEC. 5. The Treasurer shall have charge of the funds of the Society, under the direction of the Board of Managers, and shall make collections and disbursements and render an annual report, and his accounts shall be audited by a committee of the Society, not members of the Board, annually and at such other times as the Board may direct.

SEC. 6. The Secretary shall record the proceedings of the Society and of the Board of Managers, conduct correspondence, and make an annual report.

SEC. 7. The Board of Managers shall fill vacancies arising in the Board.

SEC. 8. All officers shall serve until their successors are chosen.

ARTICLE V.—*Committees.*

SECTION 1. The Board of Managers shall elect annually from its own number an Executive Committee.

SEC. 2. There shall be standing committees on Publications, Communications, Admissions, Research, and Finance, whose chairmen shall be members of the Board of Managers. These committees shall be appointed immediately after the annual election of the President to serve until their successors are designated.

SEC. 3. The committees of the Society and of the Board of Managers shall be appointed by the President, except when otherwise provided. The President shall be a member *ex officio* of every committee.

ARTICLE VI.—*Finance.*

SECTION 1. The fiscal year of the Society shall begin on the first day of January.

SEC. 2. The annual dues of members shall be two dollars, payable in January.

SEC. 3. Annual dues may be commuted and life membership acquired by the payment of one time of fifty dollars.

SEC. 4. Members whose dues remain unpaid on March 1 shall be notified by the Treasurer that unless the dues are paid within one month they will be in arrears and not entitled to vote at the annual meeting, to receive the

publications of the Society, or to purchase lecture tickets on members' terms. Members one year in arrears shall, after formal notification, be regarded as having withdrawn from the Society.

SEC. 5. The funds of the Society may be invested and loans may be negotiated in the interests of the Society, and any other financial business germane to the purposes of the Society may be transacted by the Board of Managers.

ARTICLE VII.—*Meetings.*

SECTION 1. Regular meetings of the Society shall be held on alternate Fridays from November until May.

SEC. 2. Special meetings may be ordered by the Board of Managers or called by the President.

SEC. 3. The annual meeting shall be held in the District of Columbia on the second Friday in January.

SEC. 4. Twenty members shall constitute a quorum.

SEC. 5. Regular meetings of the Board of Managers shall be held on the same days as the regular meetings of the Society; special meetings may be held at the call of the President or on notice signed by five members of the Board: *Provided*, That for any of its own meetings the Board may substitute meetings of the Executive Committee.

SEC. 6. Lectures and lecture courses may be provided by the Board of Managers. Free admission to such lectures shall not be a prerogative of membership, but tickets shall be sold to members on more favorable terms than to non-members: *Provided*, That each life member who acquired life membership prior to the year 1901 shall be entitled to two admissions to each lecture and course.

ARTICLE VIII.—*Publications.*

The Society shall publish a journal or periodical under the title THE NATIONAL GEOGRAPHIC MAGAZINE, which shall be sent to all members of the Society not in arrears, and may be placed on sale.

ARTICLE IX.—*Amendments.*

These By-Laws may be amended by a two-thirds vote of the members present at any regular meeting provided the proposed amendments are reported by the Board of Managers, and provided that notice thereof has been sent to all members of the Society not less than ten nor more than sixty days before the meeting. The publication of proposed amendments in THE NATIONAL GEOGRAPHIC MAGAZINE shall be deemed a notice within the meaning of this article.



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